PIONEER

D38

Service Manual

CIRCUIT DESCRIPTIONS
REPAIR & ADJUSTMENTS

ORDER NO.
ARP-776-0

FM/AM DIGITAL SYNTHESIZER TUNER

TX-1060
TX-1060(BK)

MODEL TX-1060 and TX-1060(BK) COMES IN VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Applicable model				Power requirement	Destination
	TX-1060	TX-1060 (BK)	TX-1060L	TX-1060L (BK)		
KU	—	○	—	—	AC 120V only	U.S.A.
S	○	○	—	—	AC 110V, 120V, 220V, 240V (Switchable)	General export
S/G	—	○	—	—	AC 110V, 120V, 220V, 240V (Switchable)	U.S. Military
HE	○	○	○	○	AC 220V, 240V (Switchable) *	European continent
HB	—	—	○	○	AC 220V, 240V (Switchable) *	United Kingdom
NEZ	○	○	—	—	AC 220V only	West Germany

* Change the primary wiring of the power transformer.

- This service manual is applicable to the KU and HE types.
- As to the HE type, please refer to pages 42-47.
- As to the S and S/G types, please refer to the additional service manual (ARP-777-0).
- As to the NEZ type, please refer to the additional service manual (ARP-779-0).
- As to the TX-1060L and TX-1060L(BK), please refer to the additional service manual (ARP-778-0).
- TX-1060(BK) and TX-1060L(BK) are the same as the TX-1060 and TX-1060L except for the exterior design (color).
- The AM tuner of the TX-1060L/HE, HB and TX-1060L(BK)/HE, HB are a two wave-band tuner with MW (medium wave) and LW (long wave), but the TX-1060 and TX-1060(BK) are MW only.
- Ce manuel d'instruction se refère au mode de réglage, en français.
- Este manual de servicio trata del método ajuste escrito en español.

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS [USA] INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
TEL: (800) 421-1404, (800) 237-0424
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 2740 Beveren, Belgium TEL: 03/775·28·08
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia
TEL: (03) 580-9911

FW© AUG. 1985 Printed in Japan

CONTENTS

1. SAFETY INFORMATION 2
2. SPECIFICATIONS 3
3. PANEL FACILITIES 4
4. CONNECTION DIAGRAM 9
5. PARTS LOCATION 10
6. EXPLODED VIEW 11
7. PACKING 13
8. P.C. BOARDS CONNECTION DIAGRAM 14
9. SCHEMATIC DIAGRAM 17
10. ELECTRICAL PARTS LIST 20
11. ADJUSTMENTS 23
    RÉGLAGES 25
    AJUSTE 27
12. BLOCK DIAGRAM 29
13. CIRCUIT DISCRIPTION 30
14. IC DISCRIPTION 35
15. FOR HE TYPE 42

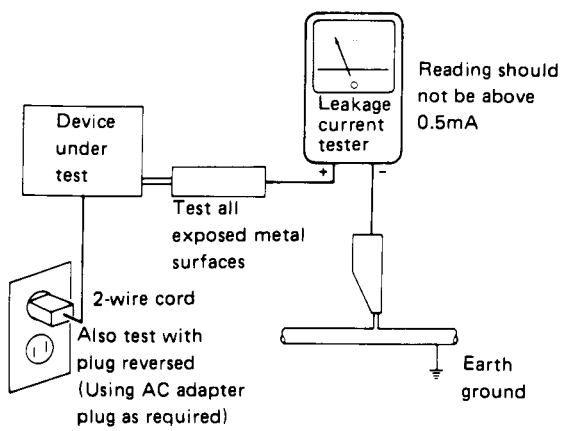
1. SAFETY INFORMATION

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technical.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.


Leakage current tester
Reading should not be above 0.5mA
Device under test
Test all exposed metal surfaces
2-wire cord
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

2. SPECIFICATIONS

FM Tuner Section

Frequency range
(except S and S/G models) ..... 87.5 MHz to 108 MHz
(S model) ..... 88 MHz to 108 MHz
Usable Sensitivity ..... 11.2 dBf, IHF (1.0 μV/75 Ω)
50 dB Quieting Sensitivity ..... Stereo, 36.2 dBf, IHF (17.8 μV/75 Ω)
Sensitivity (DIN) ..... Mono; 0.9 μV/75 Ω
Stereo; 30 μV/75 Ω
Signal-to-Noise Ratio ..... Mono; 78 dB (at 80 dBf)
Stereo; 76 dB (at 80 dBf)
Signal-to Noise Ratio (DIN) ..... Mono; 66 dB
Stereo; 60 dB
Distortion (at 80 dBf) ..... Stereo; 0.35% (1 kHz)
Alternate Channel Selectivity ..... 67 dB (400 kHz)
Stereo Separation ..... 40 dB (1 kHz)
Frequency Response ..... $^{+0.5}_{-1.5}$ dB (30 Hz to 15 kHz)
Image Response Ratio ..... 50 dB
IF Response Ratio ..... 110 dB
AM Suppression Ratio ..... 50 dB
Antenna Input ..... 300 Ω balanced
75 Ω unbalanced

AM Tuner Section

Frequency range
When 10 kHz step 530kHz to1,600kHz
When 9 kHz step ..... 531 kHz to 1,602 kHz
(except S, S/G and KU models) ..... 531 kHz to 1,602 kHz
(S model) ..... 530 kHz to 1,600 kHz
Sensitivity (IHF, Loop antenna) ..... 300 μV/m
Selectivity ..... 22 dB
Signal-to-Noise Ratio ..... 52 dB
Image Response Ratio ..... 40 dB
IF Response Ratio ..... 50 dB
Antenna ..... Loop Antenna

Audio Section

Output Level
FM (100% MOD) ..... 650 mV/3.6 kΩ
AM/LW (30% MOD) ..... 150 mV/3.6 kΩ

Miscellaneous

Power Requirements
KU model ..... AC 120 Volts, 60 Hz
S and S/G models ..... AC 110/120/220/240 V (switchable) 50/60 Hz
Power Consumption ..... 9.5 W
Dimensions ..... 420 (W) x 60 (H) x 219 (D) mm
16-9/16(W) x 2-3/8(H) x 8-5/8(D) in
Weight (without package) ..... 2.4 kg (5 lb 5 oz)

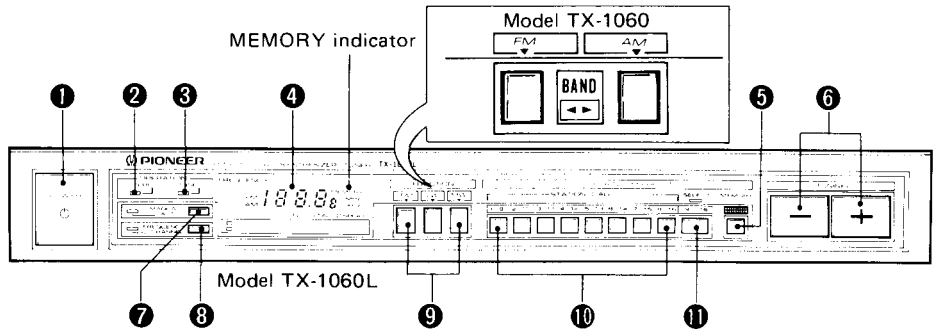
Furnished Parts

FM T-type Antenna 1
AM Loop Antenna 1
Connection Cord with Pin Plugs 1
Operating Instructions 1

NOTE:
Specifications and design subject to possible modification without notice due to improvements.

3. PANEL FACILITIES

3-1. FRONT PANEL FACILITIES



❶ POWER switch

When this switch is set to the on position, power is supplied to the tuner's main circuits. The unit's POWER switch is geared to selecting the transformer's secondary and so even at the stand-by position, the unit's circuitry will work as long as the power cord is connected to a power outlet. Disconnect the power cord from the power outlet when you do not plan to use the unit for a long period of time.

❷ FM STEREO indicator

This lights when a stereo program has been picked up during an FM broadcast.

❸ TUNED indicator

This lights up to indicate when finest tuning of a station has been achieved.

❹ FREQUENCY display

This shows the frequency of the station currently being received in digital form.The FM band is indicated by MHz, and the AM (LW, MW) band by kHz.

❺ MEMORY switch

This is used to memorize stations. When the switch is depressed, the MEMORY indicator will light. To memorize the frequency of any station, press the STATION CALL switch while the MEMORY indicator is lighting up.

❻ TUNING switches (−, +)

These are used to locate stations. Push the left half of this switch "−" to locate a station broadcasting on a lower frequency and the right half of this switch "+" to locate a station broadcasting on a higher frequency.

❼ MANUAL/AUTO selector

Use this switch in combination with the FREQUENCY/CHANNEL selector when changing the tuning method.

- AUTO SEARCH TUNING, • MANUAL TUNING
- AUTO INDEX CHANNEL SCAN, • MANUAL INDEX CHANNEL SCAN

When this selector is pressed so that the AUTO indicator lights, the AUTO mode will be activated.

❽ FREQUENCY/CHANNEL selector

Use this selector together with the MANUAL/AUTO selector of ❼ when changing the tuning method. When it is pressed so that the CHANNEL indicator lights, the CHANNEL mode will be activated.

❾ FUNCTION switches

These are used to select either the FM, MW or LW broadcasting bands.
FM: Push to receive FM band broadcasts.
MW: Push to receive MW band broadcasts.
LW: Push to receive LW band broadcasts.

Only AM/FM switching is avilable for the TX-1060 model.

❿ STATION CALL switches

These are used to preset and recall broadcasting stations.

⓫ Station mode SELECT switch/indicator

Use this switch to set the station call switches to either the No.1 mode (1 – 8), or the No.2 mode (9 – 16). When the switch is pressed so that the indicator lights, the No.2 mode (9 – 16) has been selected.

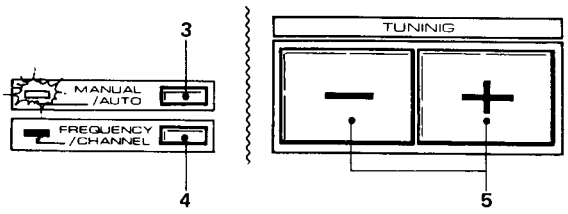
NOTE:
Merely setting this switch will cause no change in tuner operation.

• AUTOMATIC AND MANUAL TUNING

- Check that all terminals are properly connected before switching on the unit.
- Before starting to use the unit, turn the FUNCTION switches on the stereo amplifier to TUNER.

AUTO SEARCH TUNING

The electronic tuning circuit inside the unit will search for your desired station automatically.



This tuning method is used in the following cases:

- When presetting each frequency corresponding to the desired station using the STATION CALL switch.
- When tuning in to a station irrespective of the preset stations reception area, perform tuning manually using the following procedure.

1. **Turn on the POWER of the unit and the stereo amplifier.**
2. **Select your desired broadcasting band using the FUNCTION switches.**
3. **Press the MANUAL/AUTO selector so that the AUTO indicator lights.**
4. **Press the FREQUENCY/CHANNEL selector so that the CHANNEL indicator goes out.**
5. **Press the "+" or "−" TUNING switch.**

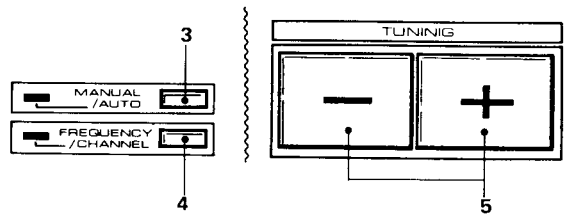
By simply pressing the tuning switch, the receiver will automatically search for a station and tune in to it. By pressing "+", the frequency will move upwards, and by pressing "−", the frequency will move downwards. Each time the switch is pressed, the next higher (or lower) frequency station will be tuned in.

NOTE:
When the AUTO SEARCH is in use, reception may not be possible over long distances or when signals are weak. At these times manual tuning is recommended.

Caution with Auto-Search:

- Since this is a highly sensitive mechanism, the frequency Auto-Search operation may stop even with weak foreign broadcasts, particularly at night. Also, frequency noise in large cities may cause the search operation to stop.
- When using Auto-Search to preset AM stations, if the frequency search operation stops too frequently, changing the position of the AM loop antenna may be of help in reducing its sensitivity so that only powerful, nearby stations are received. After tuning in the station, be sure to reposition the antenna to its best position for reception.
- For very weak stations, use the manual tuning mode to preset stations.

MANUAL TUNING



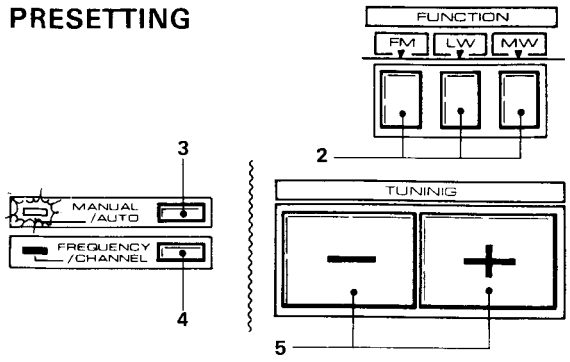
1. **Turn on the POWER of the unit and the stereo amplifier.**
2. **Select your desired broadcasting band using the FUNCTION switches.**
3. **Press the MANUAL/AUTO selector so that the AUTO indicator goes out.**
4. **Press the FREQUENCY/CHANNEL selector so that the CHANNEL indicator goes out.**
5. **Use the TUNING switches "−" or "+" to locate the frequency of your desired station.**

For step-by-step searching, press the TUNING switch once and release it immediately. For continuous rapid scanning keep the TUNING switch pressed. The OPERATION TUNED indicator will light up when the desired station is tuned in best.

NOTE:
The OPERATION TUNED indicator will not function for broadcasts received over long distances or when signals are weak. When an FM broadcast is received in MANUAL TUNING, muting will not operate.

• PRESETTING STATIONS

PRESETTING



1. Turn on power to this unit and the stereo amplifier.

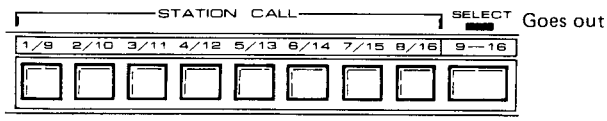
2. Select the broadcasting band to be memorized, using the FUNCTION switch.

3 Tune in desired station.

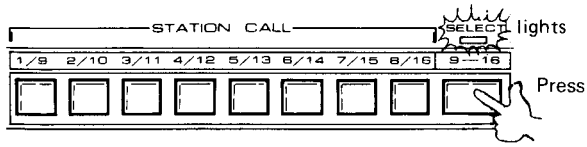
- See the AUTO SEARCH TUNING section for information on reception using Auto-Search tuning.
- See the MANUAL TUNING section for information on reception using Manual tuning .

4 Press the station mode SELECT switch to select Mode 1 or Mode 2.

When presetting using Mode 1 STATION CALL switches



When presetting using Mode 2 STATION CALL switches



5 Press the MEMORY switch.

- The Memory indicator lights.

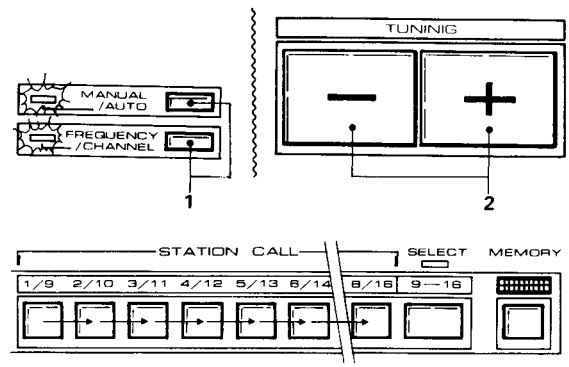
6 Press the STATION CALL switch into which you wish to preset the station.

- Perform presetting during the time that the MEMORY indicator lights.
- If the MEMORY indicator goes out, presetting is no longer possible. Press the MEMORY switch again to perform presetting.

7. Repeat steps 2 to 6 to preset stations into STATION CALL switches 1 through 16.

Up to 16 AM (MW, LW on TX-1060L) and FM stations may be randomly memorized.
If you accidently preset a station into a STATION CALL switch which contains information, it will be erased and the new station will be entered instead.

PRESET STATION VERIFICATION



1. Press the FREQUENCY/CHANNEL and MANUAL/AUTO selectors so that the both indicators light.

2. Press the "+" or "−" TUNING switch.

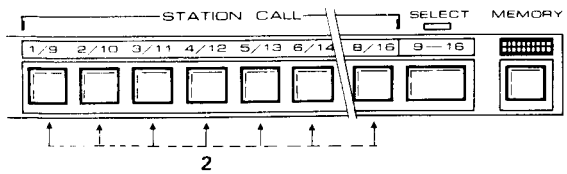
The receiver will search for the frequency of each station which was preset by the STATION CALL switches. Each station will be tuned in successively, and the channel number and frequency (MHz or kHz) will be displayed for about 5 seconds. Observe this display to check whether or not the desired preset station has been tuned in.

RECEPTION USING PRESET CALL

Press the STATION CALL switch corresponding to the previously preset station.

AUTO INDEX CHANNEL SCAN

You can find out what programs are being broadcast on each of the preset stations using the PRESET STATION VERIFICATION procedure described above. As each preset station is tuned in, press the STATION CALL switch to listen to the broadcast.



1 **Turn on power to this unit and to the stereo amplifier.**

2. **Press the FREQUENCY/CHANNEL and MANUAL/AUTO selectors so that the both indicators light.**

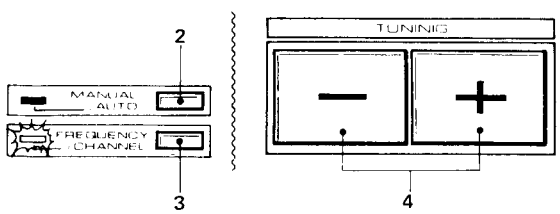
3. **Press the "+" or "—" TUNING switch.**

4. **Press the STATION CALL switches corresponding to the previously preset station that you wish to hear.**

By following these procedures, tuning may be effected simply and accurately.

MANUAL INDEX CHANNEL SCAN

Use the following procedure to manually tune in each preset station in sequence.



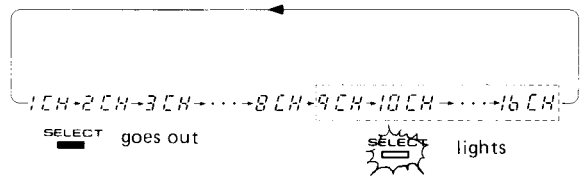
1 **Switch ON this unit and also the stereo amplifier.**

2 **Press the MANUAL/AUTO selector so that the AUTO indicator goes out.**

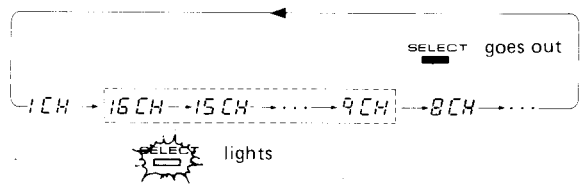
3 **Press the FREQUENCY/CHANNEL selector so that the CHANNEL indicator lights.**

4 **Press the "+" or "—" TUNING switch.**

When "+" is pressed, the stations will appear in the sequence:



When "—" is pressed, the stations will appear in the sequence:



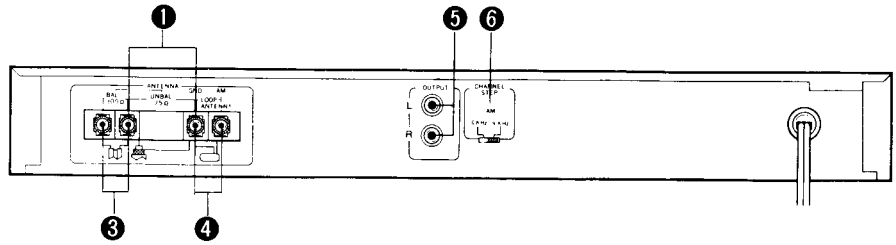
Last station memory

- When the POWER switch is pressed to turn power on, the last station received before the power was previously turned off will be received again.
- When power is ON, if the FUNCTION switches are pressed, the last station received before the FUNCTION switches were previously pressed will be received again.

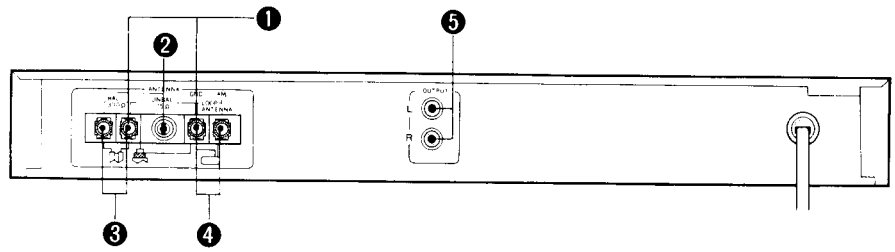
3-2. REAR PANEL FACILITIES

Depending on the point of destination, the rear panel terminals and switches differ as follows:

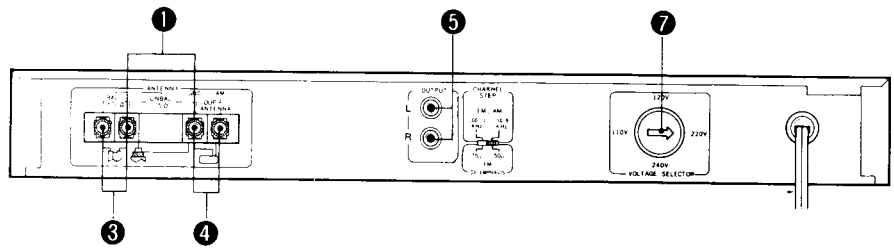
For U.S.A type
(KU type)



For U.K. and
European types
(HE and HB types)



Types for other countries
(S and S/G types)



❶ FM 75-ohm terminals/GND (UNBAL 75 Ω)

Connect an outdoor FM antenna using 75-ohm coaxial cable.

❷ FM 75-ohm terminal (UNBAL 75 Ω)

Connect an outdoor FM antenna using 75-ohm coaxial cable with PAL connector.

(Applicable to U.K. and European models only.)

❸ FM 300-ohm terminal

Connect an outdoor FM antenna and accessory FM T-type antenna using 300-ohm feeder.

❹ AM loop terminals/GND

Use for connecting the accessory AM loop antenna, an outdoor AM antenna, and for making antenna ground connections.

❺ Audio OUTPUT jacks

Connect these jacks to the TUNER input jacks of your stereo amplifier.

❻ CHANNEL STEP/DE-EMPHASIS switch (Applicable to multi-voltage models only)

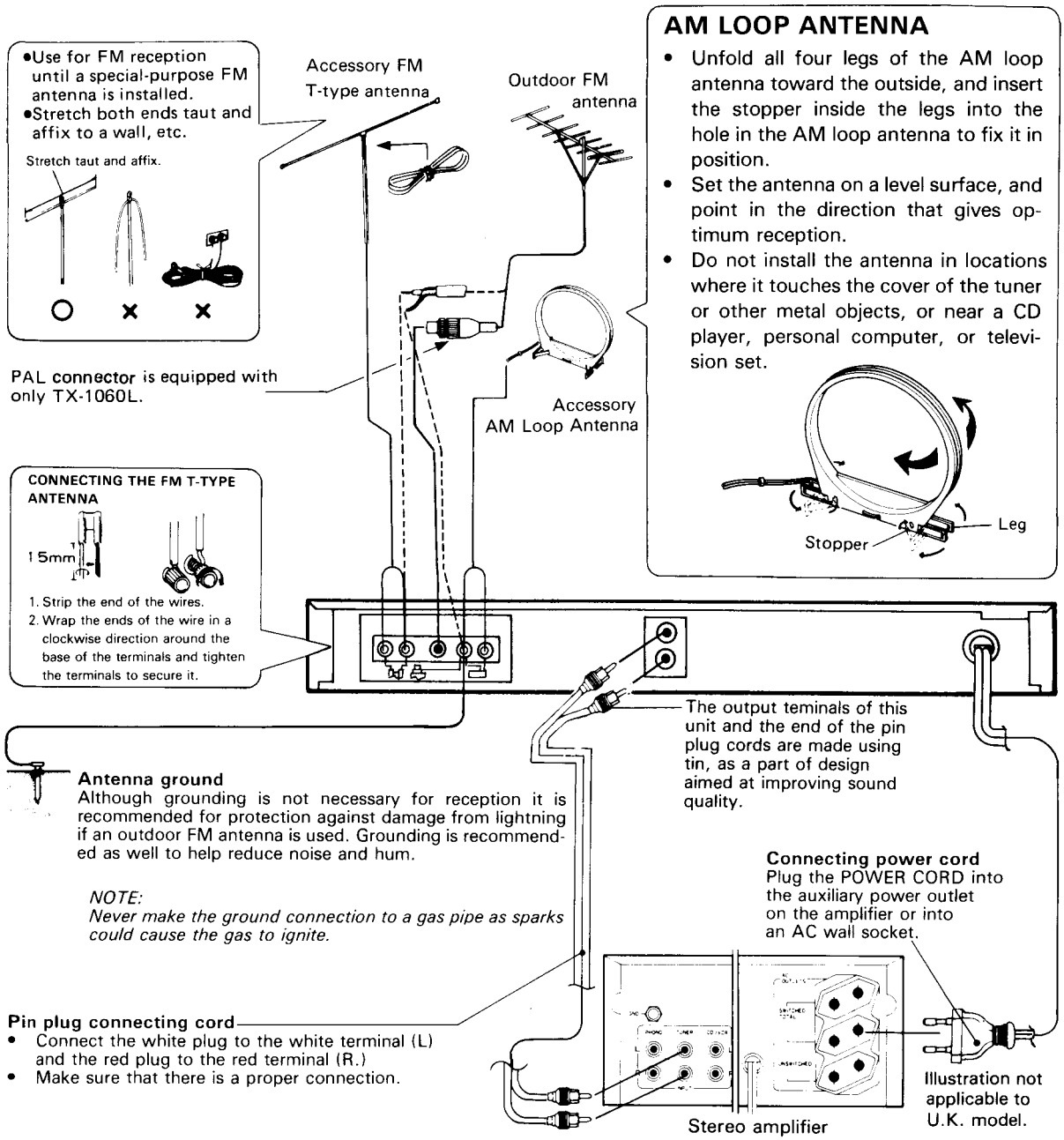
This switch has been set before shipping to the channel allocation and deemphasis value for the area in which the unit is sold. If the switch is set incorrectly, the reception frequency display will not stop, and even if reception is possible, it may sound unnatural. In order to prevent such occurences, be sure to check that the switch is set properly before using the unit.

(100/10 kHz)/75 μs ..... North America and Continental South America

(50/9 kHz)/50 μs ..... Other areas

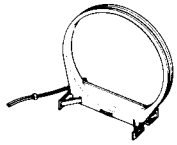
❼ LINE VOLTAGE SELECTOR switch (Applicable to multi-voltage models only)

4. CONNECTION DIAGRAM


•Use for FM reception until a special-purpose FM antenna is installed.
•Stretch both ends taut and affix to a wall, etc.
Stretch taut and affix.
Accessory FM T-type antenna
Outdoor FM antenna
PAL connector is equipped with only TX-1060L.
Accessory AM Loop Antenna
AM LOOP ANTENNA
• Unfold all four legs of the AM loop antenna toward the outside, and insert the stopper inside the legs into the hole in the AM loop antenna to fix it in position.
• Set the antenna on a level surface, and point in the direction that gives optimum reception.
• Do not install the antenna in locations where it touches the cover of the tuner or other metal objects, or near a CD player, personal computer, or television set.
Leg
Stopper
CONNECTING THE FM T-TYPE ANTENNA
15mm
1. Strip the end of the wires.
2. Wrap the ends of the wire in a clockwise direction around the base of the terminals and tighten the terminals to secure it.
The output teminals of this unit and the end of the pin plug cords are made using tin, as a part of design aimed at improving sound quality.
Antenna ground
Although grounding is not necessary for reception it is recommended for protection against damage from lightning if an outdoor FM antenna is used. Grounding is recommended as well to help reduce noise and hum.
NOTE:
Never make the ground connection to a gas pipe as sparks could cause the gas to ignite.
Connecting power cord
Plug the POWER CORD into the auxiliary power outlet on the amplifier or into an AC wall socket.
Pin plug connecting cord
• Connect the white plug to the white terminal (L) and the red plug to the red terminal (R.)
• Make sure that there is a proper connection.
Stereo amplifier
Illustration not applicable to U.K. model.

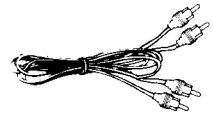
CHECKING OUT THE ACCESSORIES

AM loop antenna



FM T-type antenna

Connection cord with pin plug

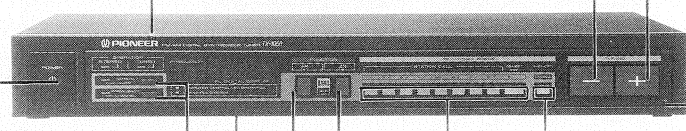


5. PARTS LOCATION

NOTES:

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Front Panel View



Tuning knob (A)
(TUNING –)
AAY-158

Tuning knob (B)
(TUNING +)
AAY-159

Bonnet case
ANE-549

Power knob (POWER)
AAY-160

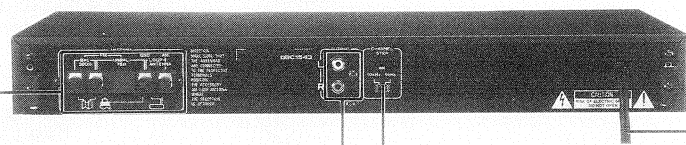
Push knob
(MANUAL/AUTO,
FREQUENCY/CHANNEL)
AAY-157

Front panel
ANY-034

Sheet panel
ANZ-016

Panel base
ANZ-135

Rear Panel View



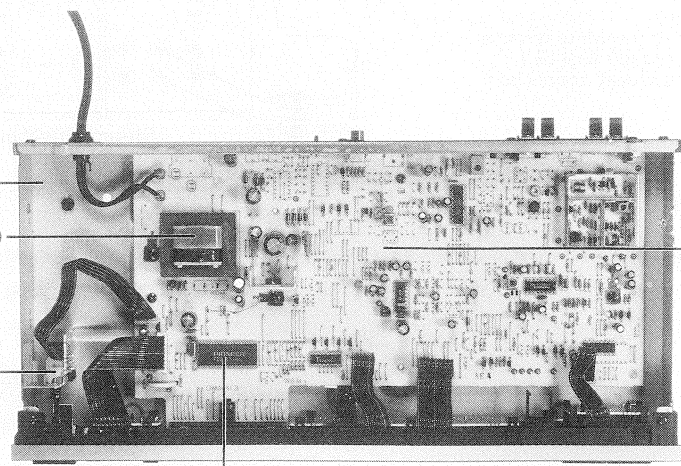
Terminal (ANTENNA)
AKA-017

Terminal (OUTPUT)
AKB-093

⚠ AC power cord
ADG-073

★★ Slide switch
(CHANNEL STEP)
ASH-034

Top View



Chassis

⚠ ★ Power fransformer (AC120V)
ATS-132

★★ Push switch
(POWER)
ASG-413

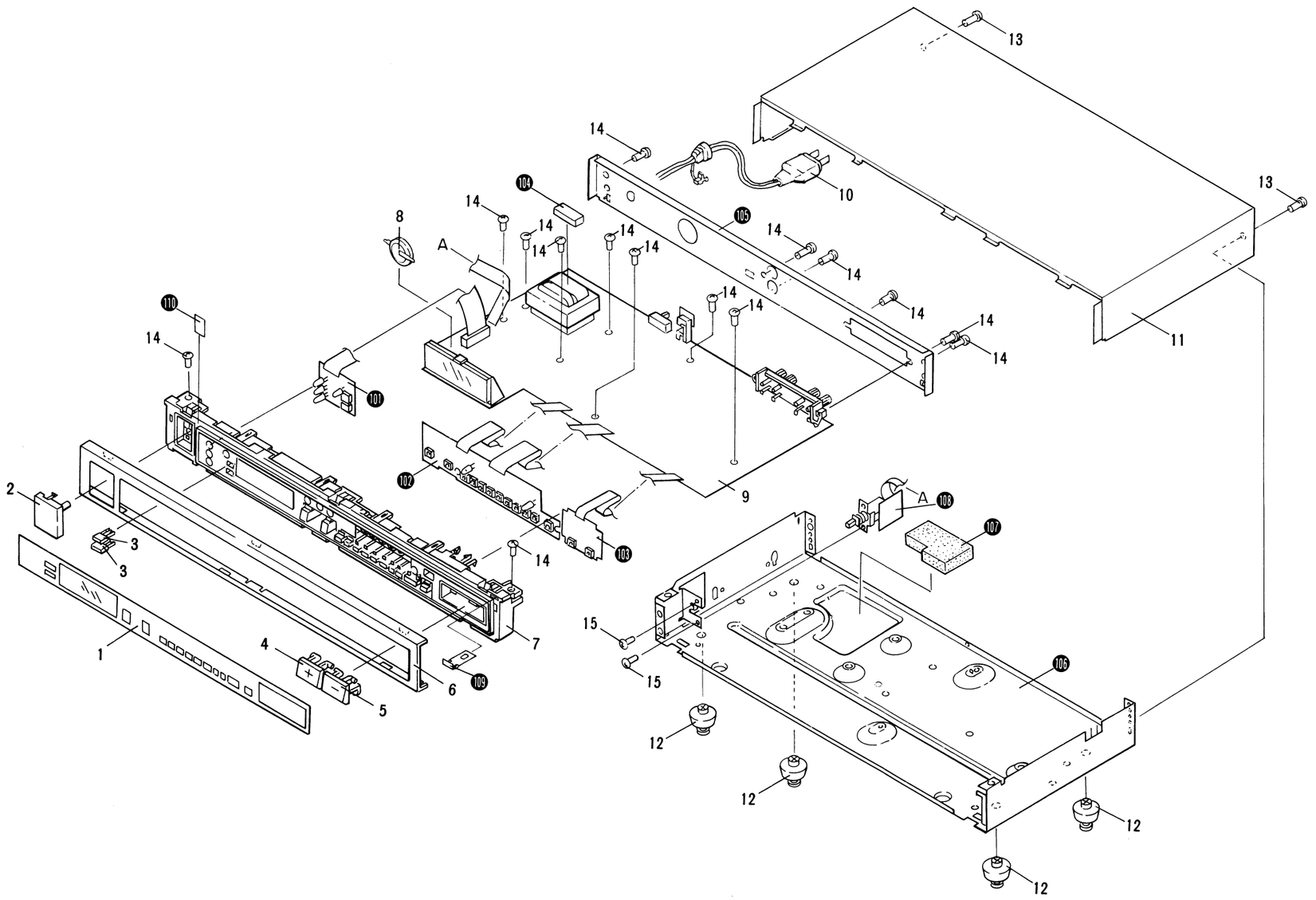
★★ IC 501
PD2011A

Complex assembly
GWM-414

6. EXPLODED VIEW

NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.



Parts List of Exploded View

Mark	No.	Part No.	Description
	1	ANZ-016	Sheet panel
	2	AAY-160	Power knob (POWER)
	3	AAY-157	Push knob (MANUAL/AUTO, FREQUENCY/CHANNEL)
	4	AAY-158	Tuning knob (A) (TUNING –)
	5	AAY-159	Tuning knob (B) (TUNING +)
	6	ANY-034	Front panel
	7	ANZ-135	Panel base
	8	AEX-022	Battery
	9	GWM-414	Complex assembly
⚠	10	ADG-073	AC power cord
	11	ANE-549	Bonnet case
	12	AEC-784	Leg assembly
	13	BBT30P080FZK	Screw
	14	BBZ30P080FZK	Screw
	15	VMZ30P060FMC	Screw
	101		Display assembly (2)
	102		Display assembly (1)
	103		Switch assembly (2)
	104		Cushion rubber (C)
	105		Rear panel
	106		Chassis
	107		Cushion rubber (A)
	108		Switch assembly (1)
	109		Ground plate
	110		Semiconductor cross

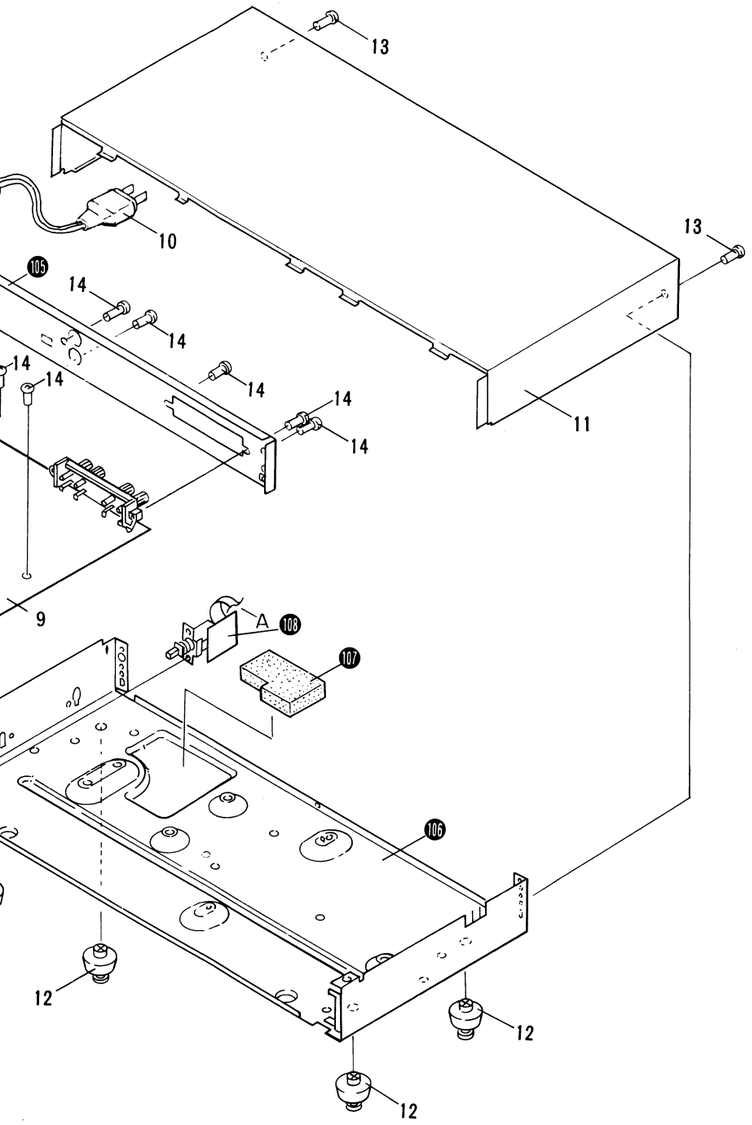
7. PAC

Parts List of

Mark	No.
	1
	2
	3
	4
	5
	6
	101
	102

NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.



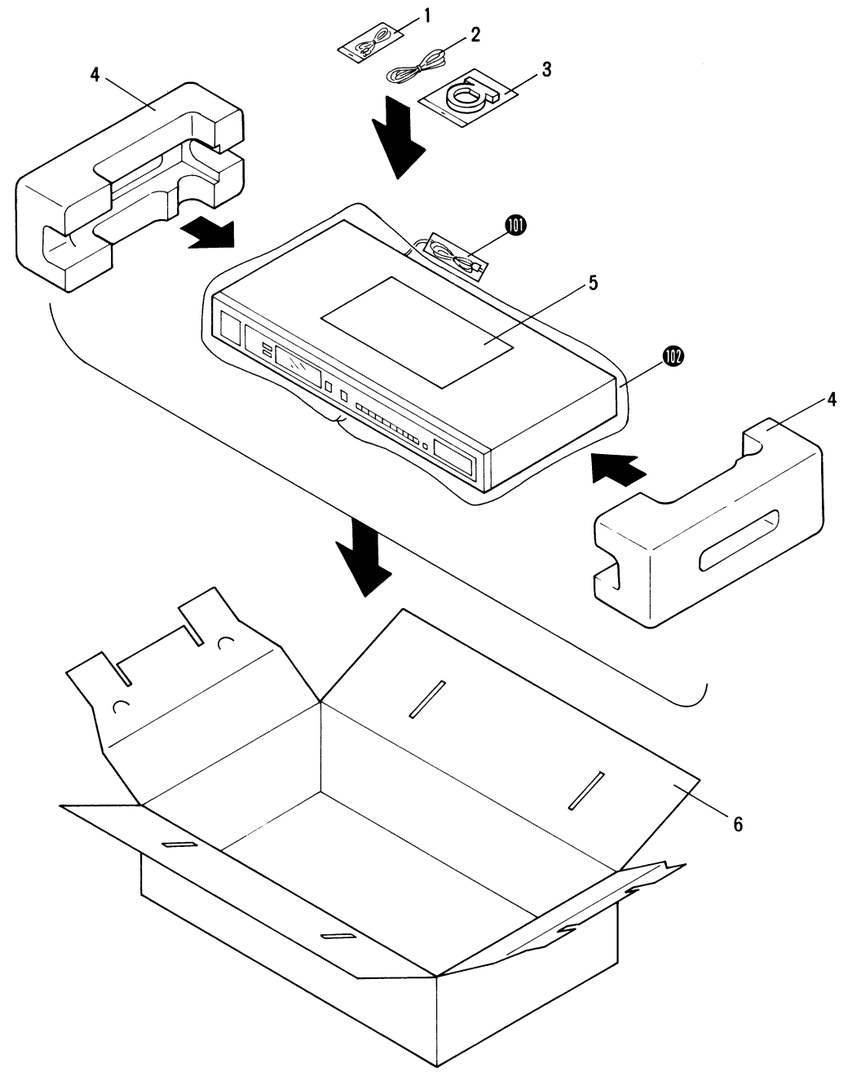
Parts List of Exploded View

Mark	No.	Part No.	Description
	1	ANZ-016	Sheet panel
	2	AAY-160	Power knob (POWER)
	3	AAY-157	Push knob (MANUAL/AUTO, FREQUENCY/CHANNEL)
	4	AAY-158	Tuning knob (A) (TUNING –)
	5	AAY-159	Tuning knob (B) (TUNING +)
	6	ANY-034	Front panel
	7	ANZ-135	Panel base
	8	AEX-022	Battery
	9	GWM-414	Complex assembly
⚠	10	ADG-073	AC power cord
	11	ANE-549	Bonnet case
	12	AEC-784	Leg assembly
	13	BBT30P080FZK	Screw
	14	BBZ30P080FZK	Screw
	15	VMZ30P060FMC	Screw
	101		Display assembly (2)
	102		Display assembly (1)
	103		Switch assembly (2)
	104		Cushion rubber (C)
	105		Rear panel
	106		Chassis
	107		Cushion rubber (A)
	108		Switch assembly (1)
	109		Ground plate
	110		Semiconductor cross

7. PACKING

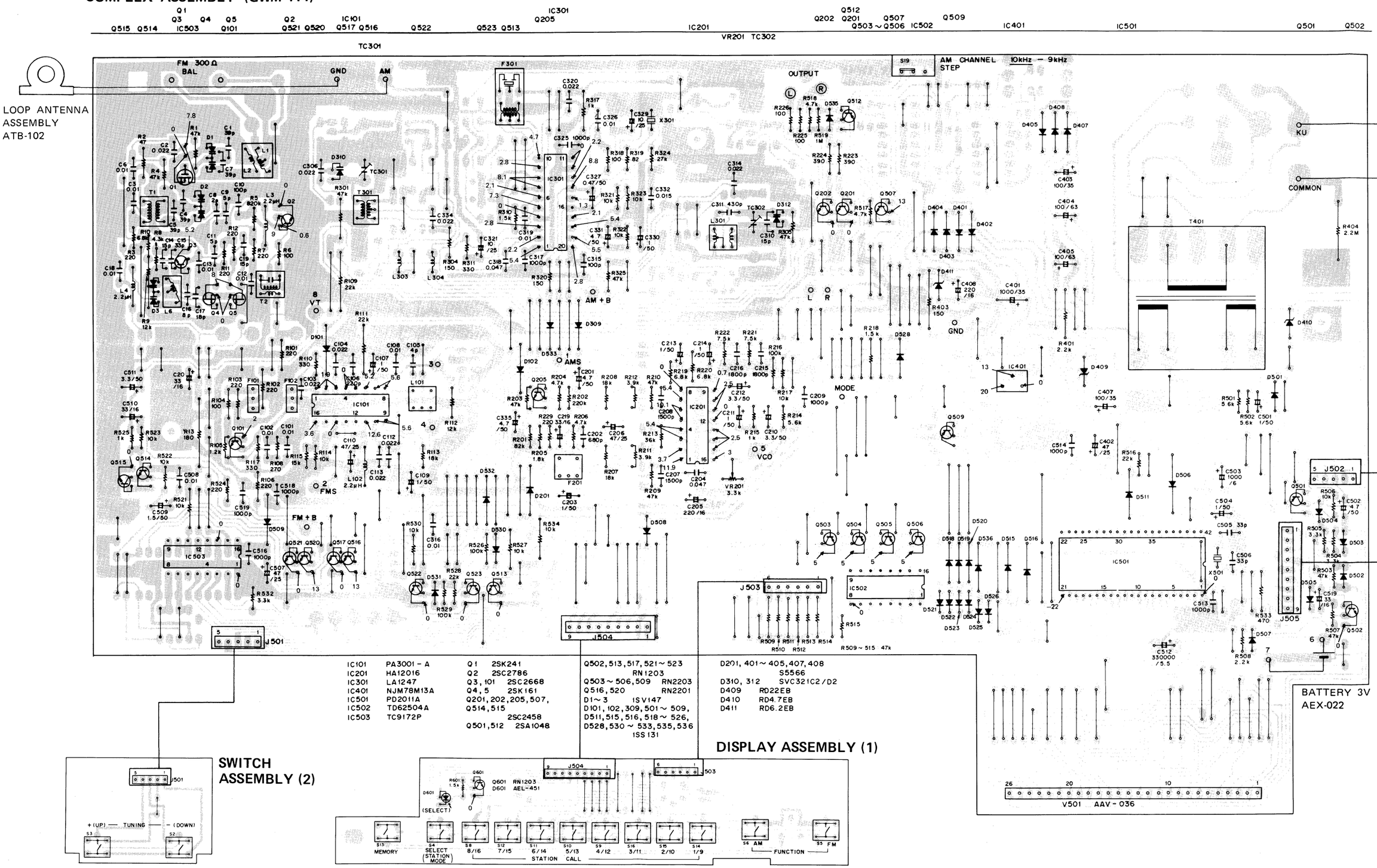
Parts List of Packing

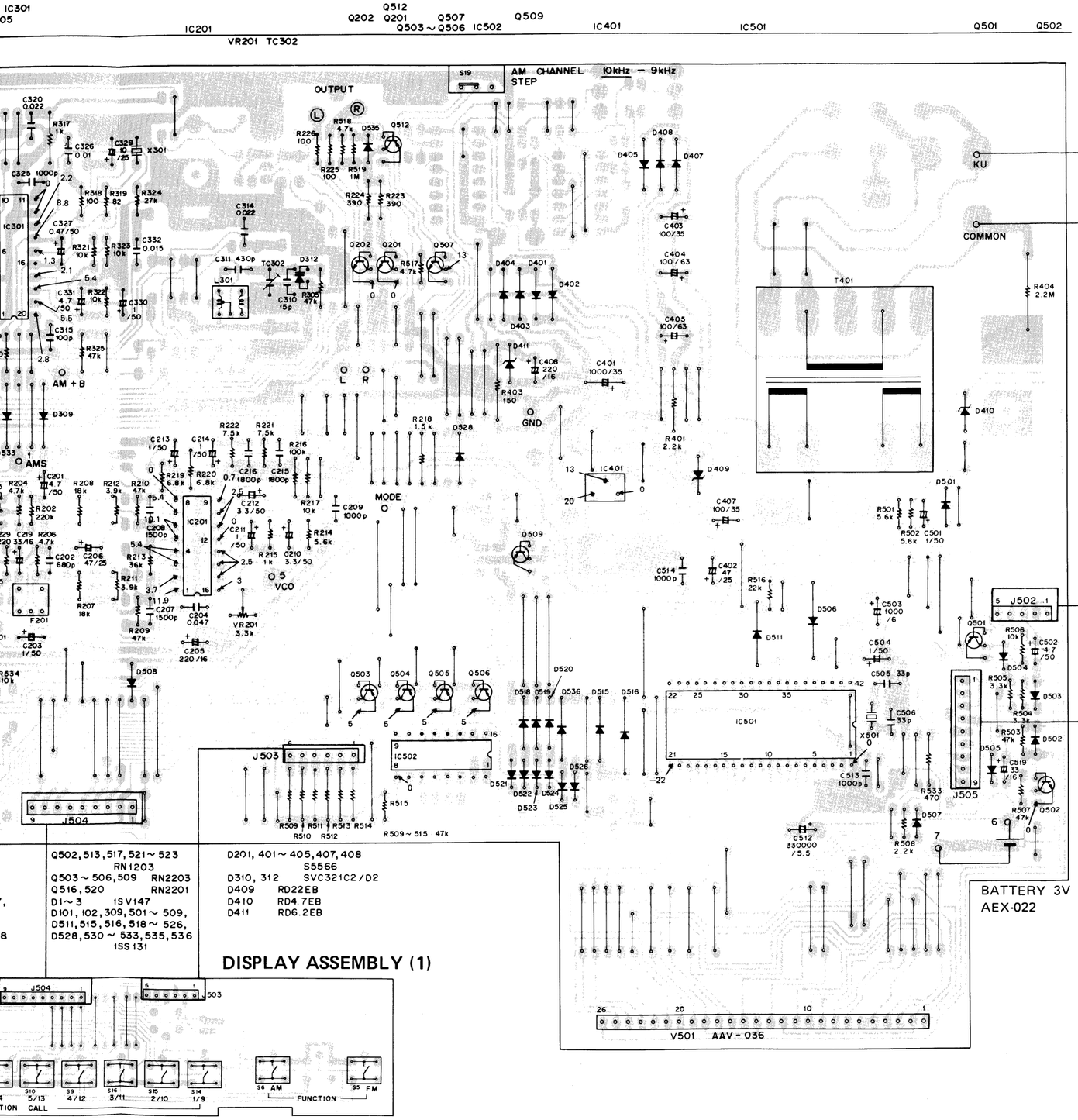
Mark	No.	Part No.	Description
	1	ADE-074	Connection cord
	2	ADH-005	FM antenna
	3	ATB-102	Loop antenna assembly
	4	AHA-341	Side pad
	5	ARB-685	Operating instructions (English)
	6	AHE-498	Packing case
	101		Vinyl bag
	102		Polyethylene sheet for packing



8. P.C. BOARDS CONNECTION DIAGRAM

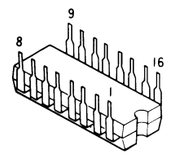
COMPLEX ASSEMBLY (GWM-414)



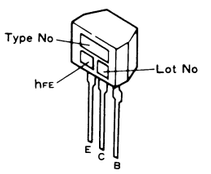


External Appearance of Transistors and IC's

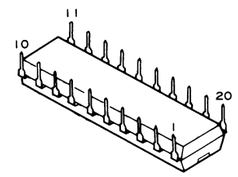
HA12016
PA3001-A
TC9172P
TD62504P



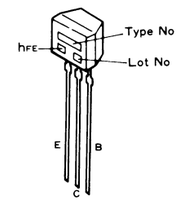
2SC2668
2SA933S
2SC1740S



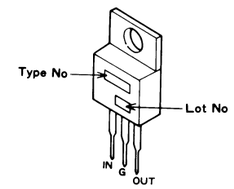
LA1247



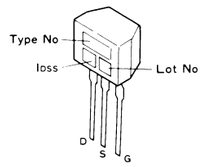
2SC2786



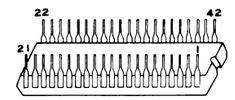
NJM78M13A



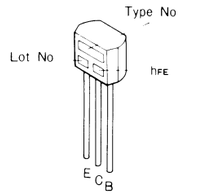
2SK161
2SK241



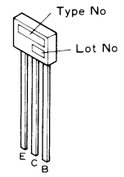
PD2011A



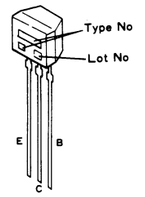
2SA1115
2SC2603



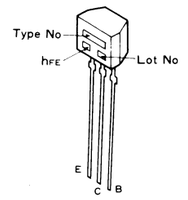
RN1203
RN2201
RN2203
2SC3400
2SA1346



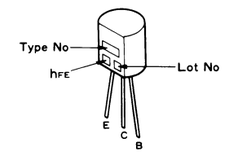
DTC124ES
DTA143ES
DTA124ES



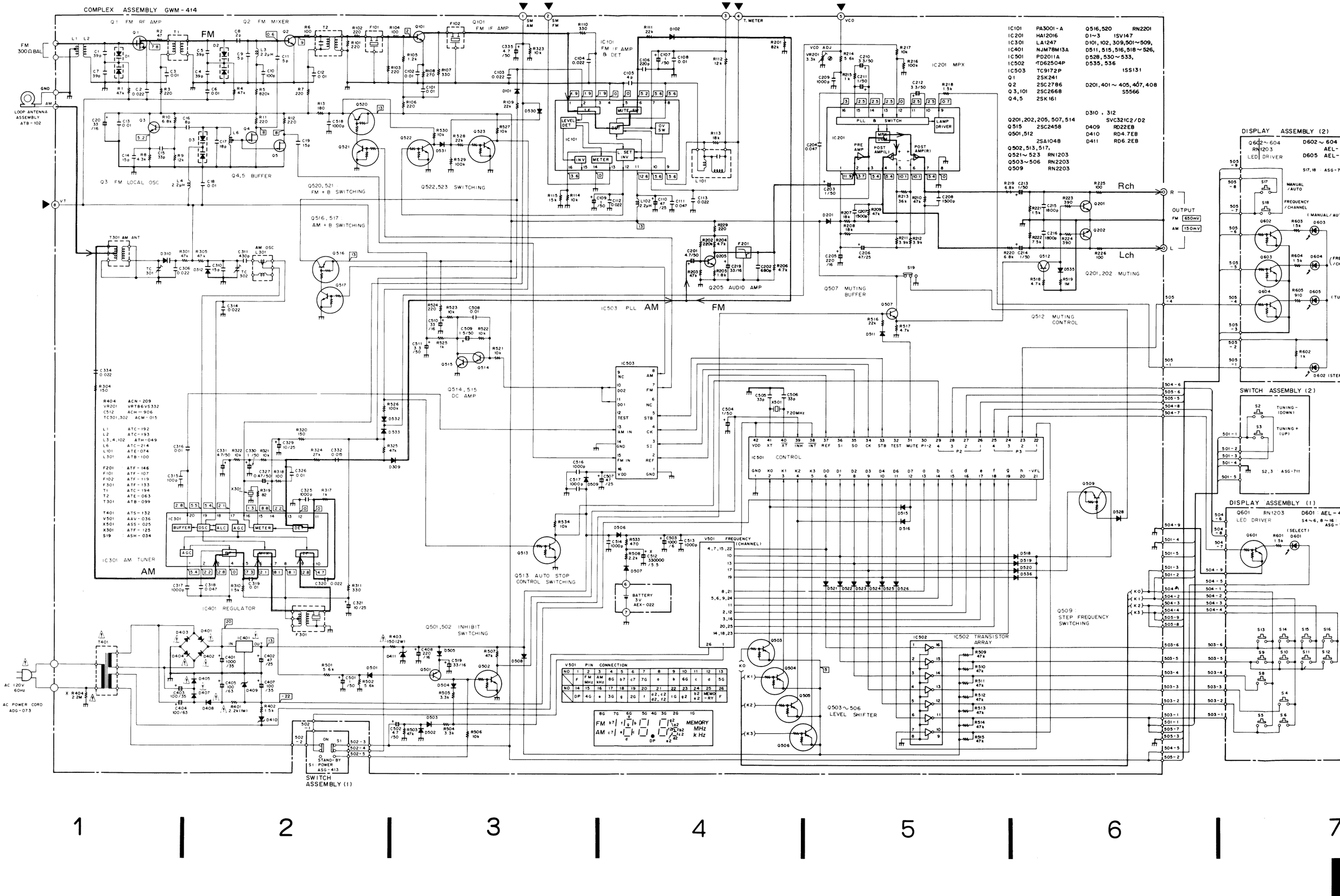
2SA1048
2SC2458

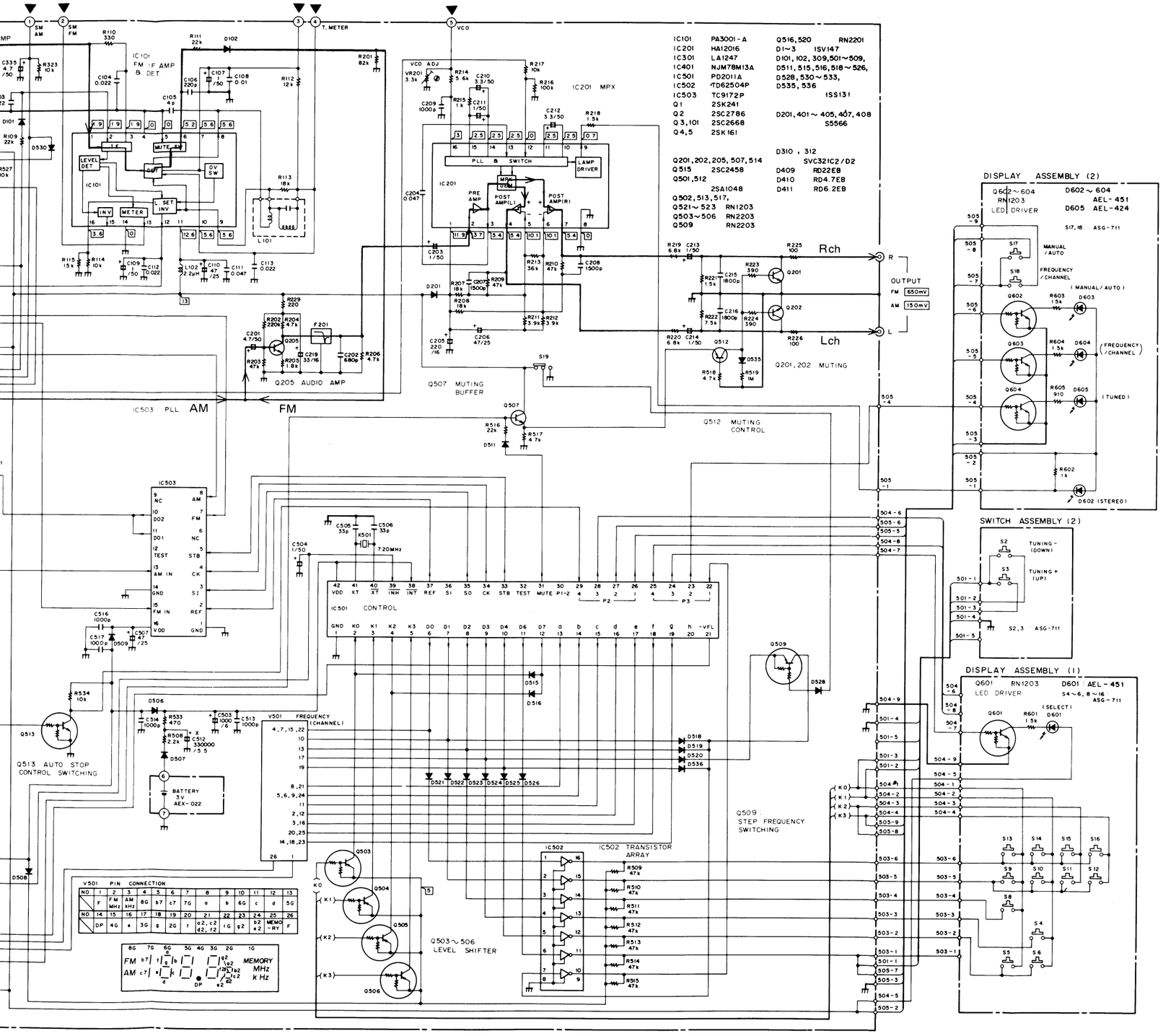


JA101
JC501



9. SCHEMATIC DIAGRAM





NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.

1. RESISTORS.
Indicated in Ω, ¼W, ⅛W.±5% tolerance unless otherwise noted k; kΩ, M; MΩ, (F); ±1%, (G); ±2%, (K), ±10%, (M); ±20% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE CURRENT.
; DC voltage (V) at no input signal
mV; Signal voltage at FM 1kHz ' 75kHz DEV.

4. OTHERS:
; Signal route.
; Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

SWITCHES:
SWITCH ASSEMBLY (1)
S1 : POWER ON — STAND-BY
SWITCH ASSEMBLY (2)
S2 : TUNING — (DOWN)
S3 : TUNING + (UP)
DISPLAY ASSEMBLY (1)
S4 : SELECT (STATION MODE)
S5 : FUNCTION FM
S6 : FUNCTION AM
S8 : STATION CALL 8/16
S9 : STATION CALL 4/12
S10 : STATION CALL 5/13
S11 : STATION CALL 6/14
S12 : STATION CALL 7/15
S13 : MEMORY
S14 : STATION CALL 1/9
S15 : STATION CALL 2/10
S16 : STATION CALL 3/11
DISPLAY ASSEMBLY (2)
S17 : MANUAL / AUTO
S18 : FREQUENCY / CHANNEL
COMPLEX ASSEMBLY
S19 : AM CHANNEL STEP 9kHz — 10kHz
The underlined indicates the switch position.

10. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560Ω	*56 × 10¹*	*561 .....*	*RD¼PS 5 6 1 J*
47kΩ	*47 × 10³*	*473 .....*	*RD¼PS 4 7 3 J*
0.5Ω	*0R5*	*.....*	*RN2H 0 R 5 K*
1Ω	*010*	*.....*	*RS1P 0 1 0 K*

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 × 10¹*	*5621 ....*	*RN¼SR 5 6 2 1 F*

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Miscellaneous Parts

Mark	Symbol & Description	Part No.
	Complex assembly	GWM-414
	Display assembly (1)	non supply
	Display assembly (2)	non supply
	Switch assembly (1)	non supply
	Switch assembly (2)	non supply
	Battery (3V)	AEX-022
⚠	AC power cord	ADG-073

Complex Assembly (GWM-414)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC201	HA12016
★★	IC301	LA1247
⚠ ★★	IC401	NJM78M13A
★★	IC101	PA3001–A
★★	IC501	PD2011A
★★	IC503	TC9172P
★★	IC502	TD62504P
★★	Q502, Q513, Q517, Q521 ~ Q523	RN1203 (DTC124ES) (2SC3400)
★★	Q516, Q520	RN2201 (DTA143ES)
★★	Q503 ~ Q506, Q509	RN2203 (DTA124ES) (2SA1346)
★★	Q501, Q502	2SA1048 (JA101) (2SA1115) (2SA933S)
★★	Q201, Q202, Q205, Q507, Q514, Q515	2SC2458 (JC501) (2SC1740S) (2SC2603)
★★	Q3, Q101	2SC2668
★★	Q2	2SC2786-L
★★	Q4, Q5	2SK161
★★	Q1	2SK241-Y
★	D409	RD22EB (HZ22EB)
★	D410	RD4.7EB (HZ4.7EB)
★	D411	RD6.2EB (HZ6.2EB)
★	D310, D312	SVC321C2 (SVC321D2)
★	D210	S5566 (11E2)
⚠ ★	D401 ~ D405, D407, D408	S5566 (11E2)
★	D101, D102, D309, D501 ~ D509, D511, D515, D516, D518 ~ D526, D528, D530 ~ D533, D535, D536	1SS131
★	D1 ~ D3	1SV147

SWITCH

Mark	Symbol & Description	Part No.
★★	S19 Slide switch (CHANNEL STEP)	ASH-034

COILS, TRANSFORMERS AND FILTERS

Mark	Symbol & Description	Part No.
	L301 AM OSC coil	ATB-100
	L1 FM ANT. coil	ATC-192
	L2 FM ANT. coil	ATC-193
	L6 FM OSC coil	ATC-214
	L101 FM DET. coil	ATE-074
	L3, L4, L102 Inductor (2.2μH)	ATH-049
	T301 AM ANT. transformer	ATB-099
	T1 FM RF transformer	ATC-194
	T2 FM Matching transformer	ATE-063
⚠ ★	T401 Power transformer (AC120V)	ATS-132
	F101 FM ceramic filter	ATF-107
	F102 FM ceramic filter	ATF-119
	F301 AM ceramic filter	ATF-133
	F201 Beat eliminate filter	ATF-146

CAPACITORS

Mark	Symbol & Description	Part No.
	C512 (0.33F/5.5V)	ACH-906
	TC301, TC302 Trimmer	ACM-015
	C14, C310	CCDCH150J50
	C15, C505, C506	CCDCH330J50
	C1, C4, C5, C7	CCDRH390J50
	C8	CCDSL020C50
	C105	CCDSL040C50
	C9, C11	CCDSL050C50
	C10, C315	CCDSL101J50
	C19	CCDSL150J50
	C106	CCDSL221J50
	C16	CCDTH080D50
	C17	CCDTH180J50
	C327	CEASR47M50
	C107, C109, C203, C211, C213, C214, C501, C504	CEAS010M50
	C509	CEAS1R5M50
	C321, C329	CEAS100M25
	C403, C407	CEAS101M35
	C404, C405	CEAS101M63
	C401	CEA102M35L
	C503	CEAS102M6
	C205, C408	CEAS221M16
	C210, C212, C310, C511	CEAS3R3M50
	C20, C219, C510, C519	CEAS330M16
	C201, C331, C335, C502	CEAS4R7M50
	C110, C206, C402, C507, C317, C325, C513, C514, C516 ~ C518	CEAS470M25
	C3, C6, C12, C13, C18, C101, C102, C108, C316, C319, C326, C508	CKDYB102K50
	C2, C103, C104, C112, C113, C306, C304, C314, C320, C334	CKDYF223Z50
	C204, C318	CKDYF473Z50
	C111	CKDYX473M25
	C207, C208	CQMA152J50
	C332	CQMA153K50
	C215, C216	CQMA182K50
	C209	CQSA102J50
	C311	CQSA431J50
	C202	CKDYB681K50

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
★	VR201 Semi-fixed (3.3kΩ)	VRTB6VS332
⚠	R404 Carbon composition (2.2MΩ 1/2W)	ACN-209
⚠	R401	RS1LMF222J
⚠	R403	RS2LMF151J
	R13	RD1/4PM181J
	Other Resistors	RD1/8PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	Terminal (ANTENNA)	AKA-017
	Terminal (OUTPUT)	AKB-093
★	V501 Fluorescent tube	AAV-036
★	X501 Crystal resorator (7.20MHz)	ASS-025
★	X301 Ceramic resonator (450kHz)	ATF-125
	Screw	PBZ30P060FMC

Display Assembly (1)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q601	RN1203 (DTC124ES) (2SC3400)
★	D601 LED (RED)	AEL-451

SWITCHES

Mark	Symbol & Description	Part No.
★★	S4 ~ S6, S8 ~ S16 (SELECT, FUNCTION (FM, AM), STATIONCALL (1/9 ~ 8/16), MEMORY)	ASG-711 (ASG-703)

RESISTOR

NOTE: When
into co

Mark	Symbo
	R601

Display Asse

SEMICONDUC

Mark	Symbo
★★	Q602
★	D602
★	D605

SWITCHES

Mark	Symbo
★★	S17, S

Switch Asse

SWITCH

Mark	Symbo
★★	S1

Switch Asse

SWITCHS

Mark	Symbo
★★	S2, S3

COILS, TRANSFORMERS AND FILTERS

Mark	Symbol & Description		Part No.
	L301	AM OSC coil	ATB-100
	L1	FM ANT. coil	ATC-192
	L2	FM ANT. coil	ATC-193
	L6	FM OSC coil	ATC-214
	L101	FM DET. coil	ATE-074
	L3, L4, L102	Inductor (2.2μH)	ATH-049
	T301	AM ANT. transformer	ATB-099
	T1	FM RF transformer	ATC-194
	T2	FM Matching transformer	ATE-063
⚠ ★	T401	Power transformer (AC120V)	ATS-132
	F101	FM ceramic filter	ATF-107
	F102	FM ceramic filter	ATF-119
	F301	AM ceramic filter	ATF-133
	F201	Beat eliminate filter	ATF-146

CAPACITORS

Mark	Symbol & Description	Part No.
	C512 (0.33F/5.5V)	ACH-906
	TC301, TC302 Trimmer	ACM-015
	C14, C310	CCDCH150J50
	C15, C505, C506	CCDCH330J50
	C1, C4, C5, C7	CCDRH390J50
	C8	CCDSL020C50
	C105	CCDSL040C50
	C9, C11	CCDSL050C50
	C10, C315	CCDSL101J50
	C19	CCDSL150J50
	C106	CCDSL221J50
	C16	CCDTH080D50
	C17	CCDTH180J50
	C327	CEASR47M50
	C107, C109, C203, C211, C213, C214, C501, C504	CEAS010M50
	C509	CEAS1R5M50
	C321, C329	CEAS100M25
	C403, C407	CEAS101M35
	C404, C405	CEAS101M63
	C401	CEA102M35L
	C503	CEAS102M6
	C205, C408	CEAS221M16
	C210, C212, C310, C511	CEAS3R3M50
	C20, C219, C510, C519	CEAS330M16
	C201, C331, C335, C502	CEAS4R7M50
	C110, C206, C402, C507	CEAS470M25
	C317, C325, C513, C514, C516 ~ C518	CKDYB102K50
	C3, C6, C12, C13, C18, C101, C102, C108, C316, C319, C326, C508	CKDYF103Z50
	C2, C103, C104, C112, C113, C306, C304, C314, C320, C334	CKDYF223Z50
	C204, C318	CKDYF473Z50
	C111	CKDYX473M25
	C207, C208	CQMA152J50
	C332	CQMA153K50
	C215, C216	CQMA182K50
	C209	CQSA102J50
	C311	CQSA431J50
	C202	CKDYB681K50

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description		Part No.
★	VR201	Semi-fixed (3.3kΩ)	VRTB6VS332
⚠	R404	Carbon composition (2.2MΩ 1/2W)	ACN-209
⚠	R401		RS1LMF222J
⚠	R403		RS2LMF151J
	R13		RD1/4PM181J
	Other Resistors		RD1/8PM□□□J

OTHERS

Mark	Symbol & Description		Part No.
	Terminal (ANTENNA)		AKA-017
	Terminal (OUTPUT)		AKB-093
★	V501	Fluorescent tube	AAV-036
★	X501	Crystal resorator (7.20MHz)	ASS-025
★	X301	Ceramic resonator (450kHz)	ATF-125
	Screw		PBZ30P060FMC

Display Assembly (1)

SEMICONDUCTORS

Mark	Symbol & Description		Part No.
★★	Q601		RN1203 (DTC124ES) (2SC3400)
★	D601	LED (RED)	AEL-451

SWITCHES

Mark	Symbol & Description	Part No.
★★	S4 ~ S6, S8 ~ S16 (SELECT, FUNCTION (FM, AM), STATIONCALL (1/9 ~ 8/16), MEMORY)	ASG-711 (ASG-703)

RESISTOR

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
	R601	RD1/8PM152J

Display Assembly (2)

SEMICONDUCTORS

Mark	Symbol & Description		Part No.
★★	Q602 ~ Q604		RN1203 (DTC124ES) (2SC3400)
★	D602 ~ D604	LED (RED)	AEL-451
★	D605	LED (GRN)	AEL-424

SWITCHES

Mark	Symbol & Description		Part No.
★★	S17, S18	Tact switch (MANUAL/AUTO, FREQUENCY/CHANNEL)	ASG-711 (ASG-703)

Switch Assembly (1)

SWITCH

Mark	Symbol & Description		Part No.
★★	S1	Push switch (POWER)	ASG-413

Switch Assembly (2)

SWITCHS

Mark	Symbol & Description		Part No.
★★	S2, S3	Tact switch [TUNING (–, +)]	ASG-711 (ASG-703)

11. ADJUSTMENTS

FM Tuner Section (TX-1060, TX-1060(BK), TX-1060L and TX-1060L(BK))

- Connect the FM signal generator (FM SG) to the FM ANTENNA 300Ω terminal through a 300Ω dummy antenna.
- Set the TX-1060 (TX-1060L) to the FM band.

(*1) Tune the FM SG to the TX-1060 (TX-1060L).

(*2) Connect the FM multiplex stereo signal generator to the FM SG external modulator terminal. Set the modulation to Main 1kHz/L+R/±68.25kHz deviation, Pilot 19kHz/±6.75kHz deviation.

Step	FM SG (1kHz, ±75kHz deviation)		TX-1060 (TX-1060L) Frequency display	Adjustment point	Adjustment procedure
	Frequency	Level			
1	98.0MHz(*1)	20dB	98.0MHz	T1, T2	Adjustment until DC voltage between terminal no. 2 (FMS) and ground is maximum.
2	98.0MHz(*1)	66dB	98.0MHz	L101	Adjust DC voltage between terminal no. 3 and no. 4 to 0±60mV (*4).
3	98.0MHz(*1) / not modulation	66dB	98.0MHz	VR201	Adjust signal between terminal no. 5 (VCO) and ground to 76kHz (within ±150Hz).
4	98.0MHz(*1) / Stereo modulation(*2) (Main=1kHz, L or R)	86dB	98.0MHz	T2 (within ±90°)	Adjust until distortion at OUTPUT L and R terminal is equaly minimum.
5	98.0MHz(*1) / Stero modulation(*2)	38dB	98.0MHz	R115	If the STEREO indicator and TUNED indicator are not on, remove R115.

(*4) The TUNED indicator should go off within 20kHz to 40kHz when moving away (in either direction) from a tuned frequency.

AM Tuner Section

MW Tuner Section (TX-1060, TX-1060(BK), TX-1060L and TX-1060L(BK))

- Connect the furnished AM loop antenna between terminals AM ANTENNA and GND.
- Connect the AM signal generator (AM SG) to the AM ANTENNA terminal through a 10kΩ resistor.
- Set the TX-1060 (TX-1060L) to the AM (MW) band.
- Set the AM CHANNEL STEP switch to the 9kHz position (KU, S and S/G types).

(*3) Tune the AM SG to the TX-1060 (TX-1060L).

Step	AM SG (400Hz, 30% modulation)		TX-1060 (TX-1060L) Frequency display	Adjustment point	Adjustment procedure
	Frequency	Level			
1	No signal		531kHz	L301	1.3±0.1V DC between terminal no. 8 (VT) and ground.
2	No signal		1602kHz	TC302	10±0.5V DC between terminal no. 8 (VT) and ground.
3	Repeat steps 1 and 2 until both specifications are correct.				
4	603kHz(*3)	76dB	603kHz	T301	Adjust until DC voltage between terminal no.1 (AMS) and ground is maximum.
5	1395kHz(*3)	76dB	1395kHz	TC301	
6	Repeat steps 4 and 5 until maximum sensitivity is attained.				

LW Tuner Section (Only TX-1060L and TX-1060L(BK))

- Connect the furnished AM loop antenna between terminals AM ANTENNA and GND.
- Connect the AM signal generator (AM SG) to the AM ANTENNA terminal through a 10kΩ resistor.
- Set the TX-1060L to the LW band.

(*3) Tune the AM SG to the TX-1060L.

Step	AM SG (400Hz, 30% modulation)		TX-1060L Frequency display	Adjustment point	Adjustment procedure
	Frequency	Level			
1	No signal		281kHz	L302	DC 5.2V ±0.3V between terminal no. 8 (VT) and ground.
2	164kHz(*3)	86dB	164kHz	T302	Adjust until DC voltage between terminal no. 1 (AMS) and ground is maximum.
3	254kHz(*3)	86dB	254kHz	TC303	
4	Repeat steps 2 and 3 until maximum sensitivity is attained.				

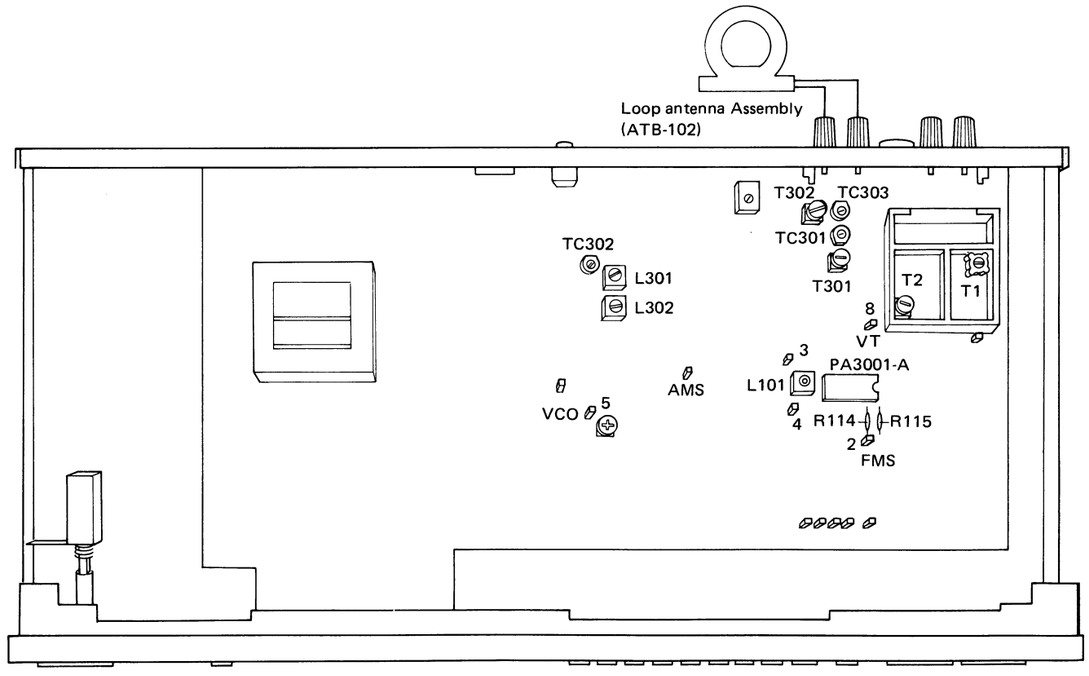


Fig. 11-1 Adjustment points

11. RÉGLAGES

Section accordeur MF(TX-1060, TX-1060(BK), TX-1060L et TX-1060L(BK))

- Brancher le génŕateur de signal MF (FM SG) sut la borne de 300 Ohms de l'antenne MF au moyen d'une antenne fictive de 300 Ohms.
- Régler le TX-1060 (TX-1060L) sur la bande MF.

(*1) Accorder le FM SG sur le TX-1060 (TX-1060L).

(*2) Brancher le générateur de signal stéréo multiplex MF sur la borne de modulation externe du FM SG. Régler la modulation du conducteur principal à une déviation de 1kHz/L+R/±68,25kHz, le pilote à une déviation de 19kHz/±6,75kHz.

Phase	FM SG (déviation de 1kHz, ±75kHz) Fréquence	Niveau	TX-1060 (TX-1060L) Affichage de fréquence	Point de réglage	Méthode de réglage
1	98,0MHz(*1)	20dB	98,0MHz	T1, T2	Régler jusqu'à ce que la tension CC entre la borne n° 2 (FMS) et la masse soit au maximum.
2	98,0MHz (*1)	66dB	98,0MHz	L101	Régler jusqu'à ce que la tension CC entre les borne n° 3 et n° 4 au 0±60mV (*4).
3	98,0MHz(*1) pas de modulation	66dB	98,0MHz	VR201	Régler le signal à 76kHz (±150Hz) entre la borne n° 5 (VCO) et la masse.
4	98,0MHz(*1) (Modulation stéréo (*2) (Principal=1kHz gauche ou droite)	86dB	98,0MHz	T2 (Entre ±90°)	Régler jusqu'à ce que la distorsion aux bornes de sortie gauche et droite soit au minimum.
5	98,0MHz (*1) Modulation stereo(*2)	38dB	98,0MHz	R115	Si les indicateurs STEREO et de calage de station (TUNED) ne sont pas allumés, retirer la résistance R115.

(*4) Le voyant TUNED devrait être éteint dans les limites de 20 kHz à 40 kHz lorsque l'on s'éloigne d'une fréquence accordée (dans n'importe quelle direction).

Section accordeur MA

Section tuner ondes moyennes (MW) (TX-1060, TX-1060(BK), TX-1060L et TX-1060L(BK))

- Brancher l'antenne bouclée MA fournie entre les bornes d'antenne MA et la masse.
- Brancher le générateur de signal MA (AM SG) sur la borne d'antenne MA à travers uns résistance de 10 kOhms.
- Régler le TX-1060 (TX-1060L) sur la bande MA (Ondes moyennes).
- Positionner le commutateur de canaux AM sur la position de 9kHz (TYPE KU, S et S/G).

(*3) Accorder le AM SG sur le TX-1060 (TX-1060L).

Phase	AM SG (Modulation 400Hz, 30%) Fréquence	Niveau	TX-1060 (TX-1060L) Affichage de fréquence	Point de réglage	Méthode de réglage
1	Pas de signal		531kHz	L301	1,3±0,1V CC entre la borne n° 8 (VT) et la masse.
2	Pas de signal		1602kHz	TC302	10±0,5V CC entre la borne n° 8 (VT) et la masse.
3	Répéter les phase 1 et 2 jusqu'à ce que les spécifications soient correctes.				
4	603kHz(*3)	76dB	603kHz	T301	Régler jusqu'à ce que la tension CC entre la borne n° 1 (AMS) et la masse soit au maximum.
5	1395kHz(*3)	76dB	1395kHz	TC301	
6	Répéter les phase 4 et 5 jusqu'à ce que soit atteint le maximum de sensibilité.				

Partie tuner grandes ondes (LW) (TX-1060L et TX-1060L(BK) uniquement)

- Brancher l'antenne bouclée MA fournie entre les bornes d'antenne MA et la masse.
- Brancher le générateur de signal MA (AM SG) sur la borne d'antenne MA à travers uns résistance de 10 kOhms.
- Régler le TX-1060L sur la bande LW.

(*3) Accorder le AM SG sur le TX-1060L.

Phase	AM SG (Modulation 400Hz, 30%) Fréquence	Niveau	TX-1060 (L) Affichage de fréquence	Point de réglage	Méthode de réglage
1	Pas de signal		281kHz	L302	CC 5,2V±0,3V entre la borne n° 8 (VT) et la masse.
2	164kHz(*3)	86dB	164kHz	T302	Régler jusqu'à ce que la tension CC entre la borne n° 1 (AMS) et la masse soit au maximum.
3	254kHz(*3)	86dB	254kHz	TC303	
4	Répéter les phase 2 et 3 jusqu'à ce que soil atteint le maximum de sensibilité.				

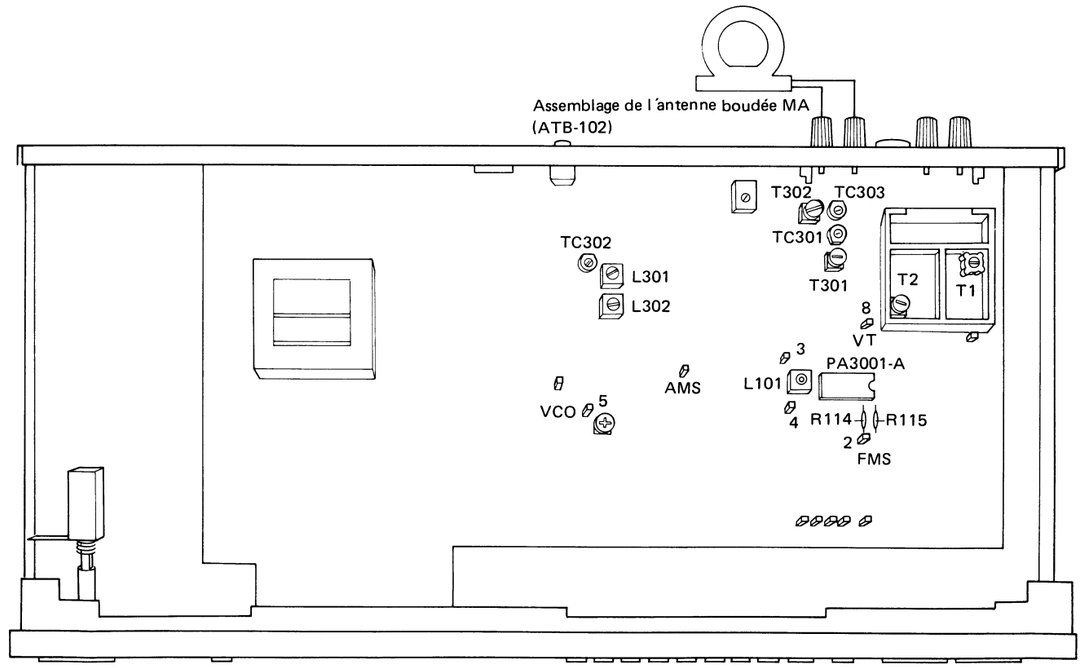


Fig. 11-1 Points de réglage

11. AJUSTE

Sección del sintonizador de FM(TX-1060, TX-1060(BK), TX-1060L y TX-1060L(BK))

- Conectar el generador de señales de FM (FM SG) al terminal FM ANTENNA 300Ω a través de una antena ficticia de 300Ω.
- Ajustar el TX-1060 (TX-1060L) a la banda de FM.

(*1) Sintonizar el FM SG con el TX-1060 (TX-1060L).

(*2) Conectar el genedador de señales estereofónicas de multiplex de FM al terminal de modulación exterior del FM SG.
Ajustar la modulación a Principal 1kHz/L+R/±68,25kHz de desviación y Piloto 19kHz/±6,75kHz de desviación.

Paso	FM SG (1kHz, desviación de ±75kHz)		Frecuencimetro del TX-1060 (TX-1060L)	Puntos de ajuste	Procedimientos de ajuste
	Frequencia	Nivel			
1	98,0MHz(*1)	20dB	98,0MHz	T1, T2	Ajustar hasta que la tensión de CC entre el terminal nº 2 (FMS) y masa sea la máxima.
2	98,0MHz(*1)	66dB	98,0MHz	L101	Ajustar hasta que la tensión de CC entre los terminales nº 3 y nº 4 a 0±60mV (*4).
3	98,0MHz(*1) 66dB / Sin modulación		98,0MHz	VR201	Ajustar la señal entre el terminal nº 5 (VCO) masa a 76kHz (±150Hz).
4	98,0MHz(*1) 86dB / Modulación estereofónica(*2) (Principalñ1kHz, izq, o der.)		98,0MHz	T2 (Dentro de ±90°)	Ajustar hasta que la distorsion en el terminal OUTPUT R o L sea la mínima.
5	98,0MHz(*1) 38dB / Modulacion estero fonica(*2)		98,0MHz	R115	Si el indicador STEREO y el indicador TUNED no están en ON translade el R115.

(*4) El indicador TUNED debería apagarse entre 20y 40kHz, cuando se mueve lejos (en cualguier dirección) desde una frecuencia sintonizada

Sección del sintonizador de AM

Sección del sintonizador de MW (TX-1060, TX-1060(BK), TX-1060L y TX-1060L(BK))

- Conectar la antena de cuadro de AM suministrada entre los terminales AM ANTENNA y GND.
- Conectar el generador de señales de AM (AM SG) al terminal AM ANTENNA a través de un resistor de 10kΩ.
- Ajustar el TX-1060 (TX-1060L) a la banda de AM (MW).
- Ajustar el selector de paso del canal de AM (AM CHANNEL STEP) en la posición de 9kHz (tipos KU, S y S/G).

(*3) Sintonizador el AM SG con el TX-1060 (TX-1060L).

Paso	AM SG (400Hz, 30% de modulación)		Frecuencimetro del TX-1060 (TX-1060L)	Puntos de ajuste	Procedimientos de ajuste
	Frequencia	Nivel			
1	Sin señal		531kHz	L301	1,3±0,1V CC entre el terminal nº 8 (VT) y masa.
2	Sin señal		1602kHz	TC302	10±0,5V CC entre el terminal nº 8 (VT) y masa.
3	Repetir los pasos 1 y 2 hasta que ambas especificaciones sean correctas.				
4	603kHz(*3)	76dB	603kHz	T301	Ajustar hasta que la tension de CC entre el terminal nº 1 (AMS) y masa sea la máxima.
5	1395kHz(*3)	76dB	1395kHz	TC301	
6	Repetir los pasos 4 y 5 hasta lograrse la máxima sensibilidad.				

Sección del sintonizador de LW (Solo TX-1060L y TX-1060L(BK))

- Conectar la antena de cuadro de AM suministrada entre los terminales AM ANTENNA y GND.
- Conectar el generador de señales de AM (AM SG) al terminal AM ANTENNA a través de un resistor de 10kΩ.
- Ajustar el TX-1060L a la banda de LW.

(*3) Sintonizador el AM SG con el TX-1060L.

Paso	AM SG (400Hz, 30% de modulación)		Frecuencímetro del TX-1060(L)	Puntos de ajuste	Procedimientos de ajuste
	Frequencia	Nivel			
1	Sin señal		281kHz	L302	5,2V CC ±0,3V entre el terminal nº 8 (VT) y masa.
2	164kHz(*3)	86dB	164kHz	T302	Ajustar hasta que la tensión de CC entre el terminal nº 1 (AMS) y masa sea la máxima.
3	254kHz(*3)	86dB	254kHz	TC303	
4	Repetir los pasos 2 y 3 hasta lograrse la máxima sensibilidad.				

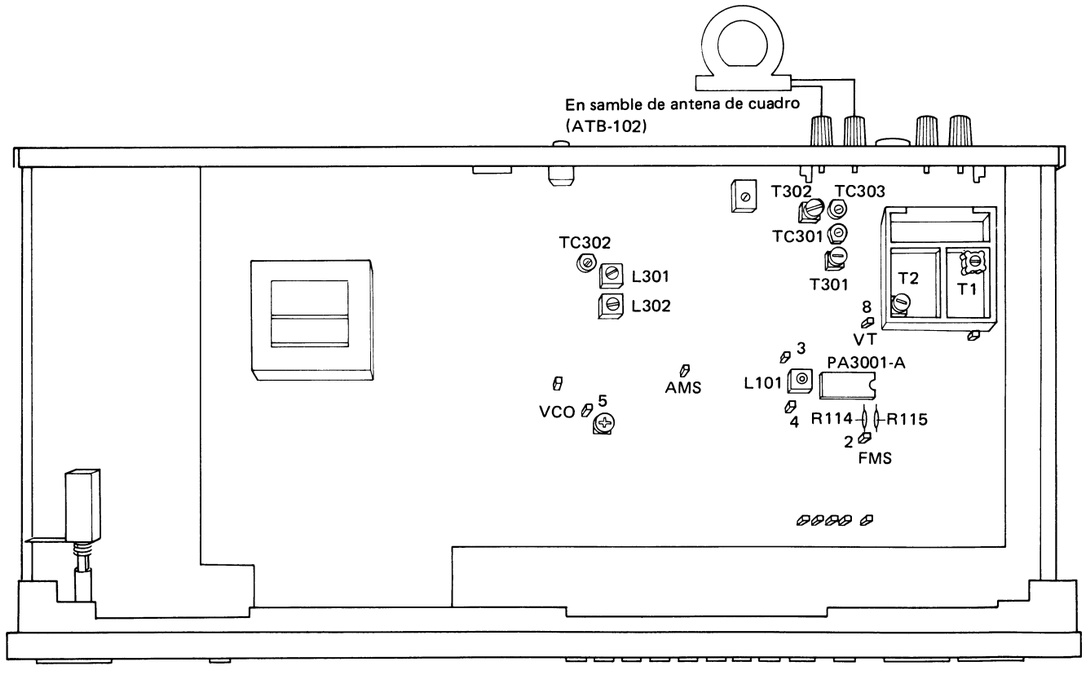
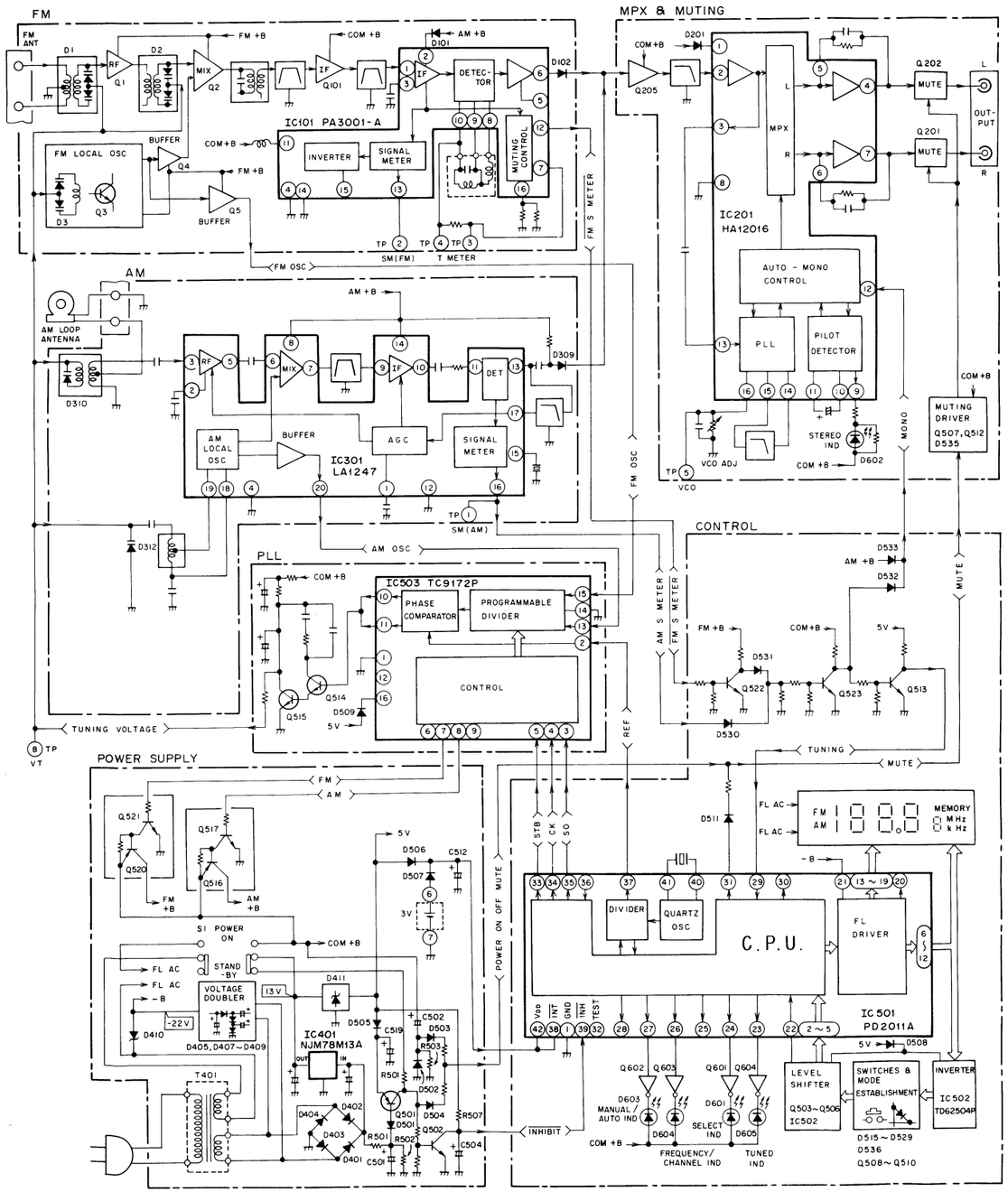


Fig. 11-1 Puntos de ajuste

12. BLOCK DIAGRAM



: Indicates the transistor section of an inherent resistor transistor.

: Indicates a transistor that does not have an inherent resistor.

13. CIRCUIT DESCRIPTION

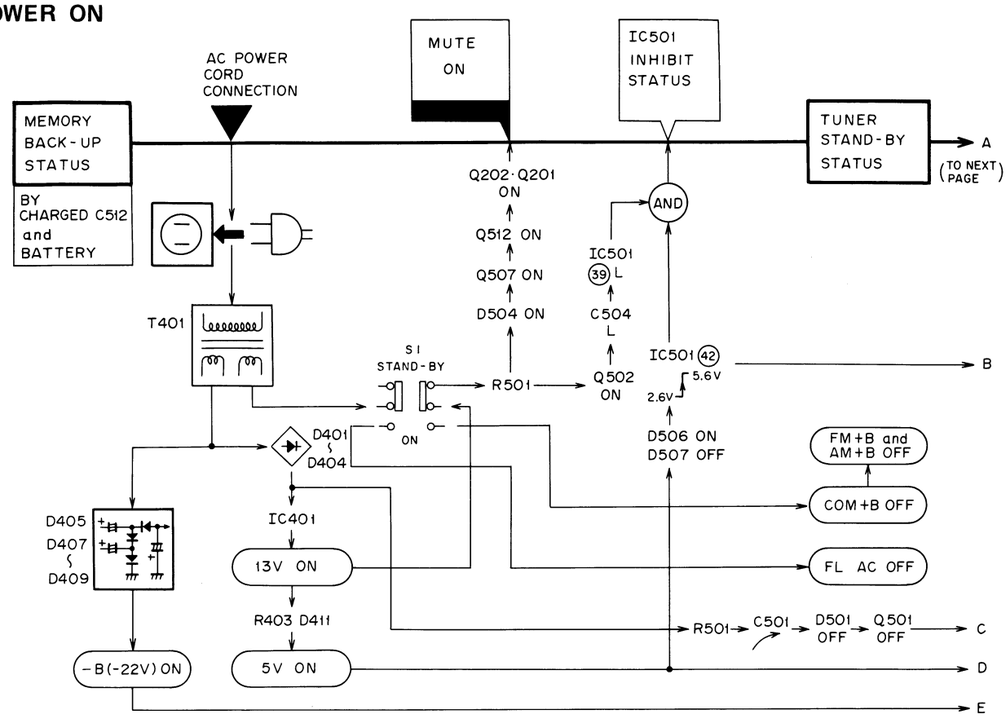
: Indicates movements for mechanical operations.

: Indicates changes in modes.

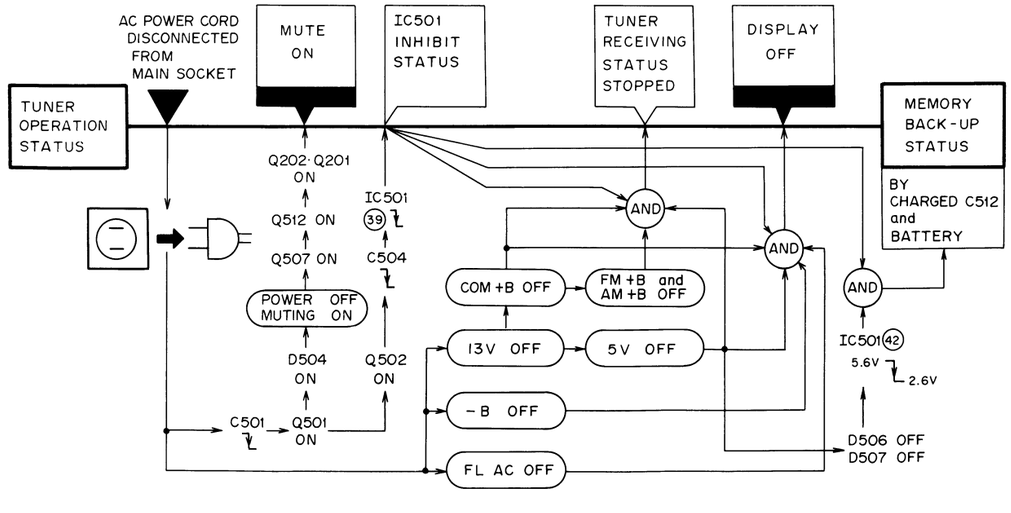
: Indicates data transmission.

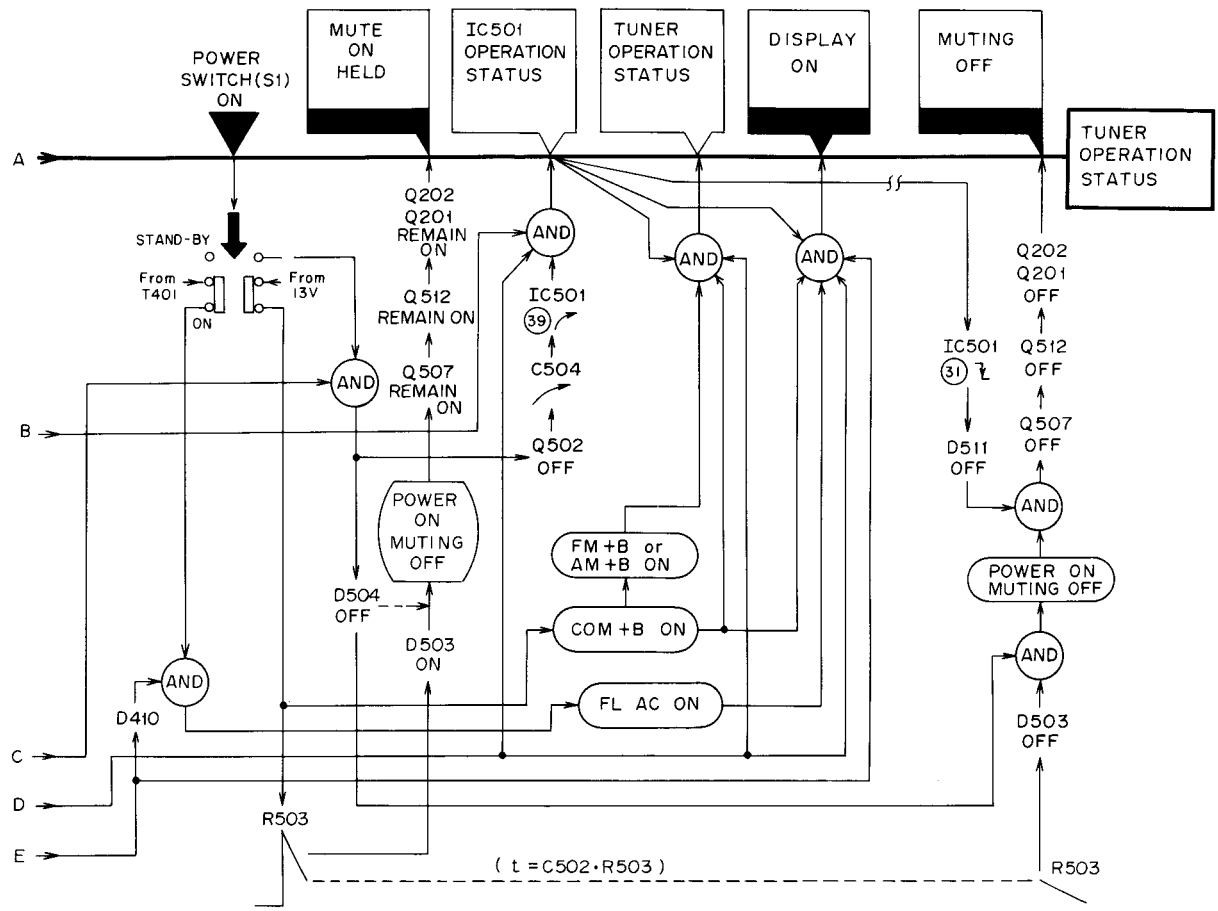
: Indicates the presence of a multiple signal.

POWER ON

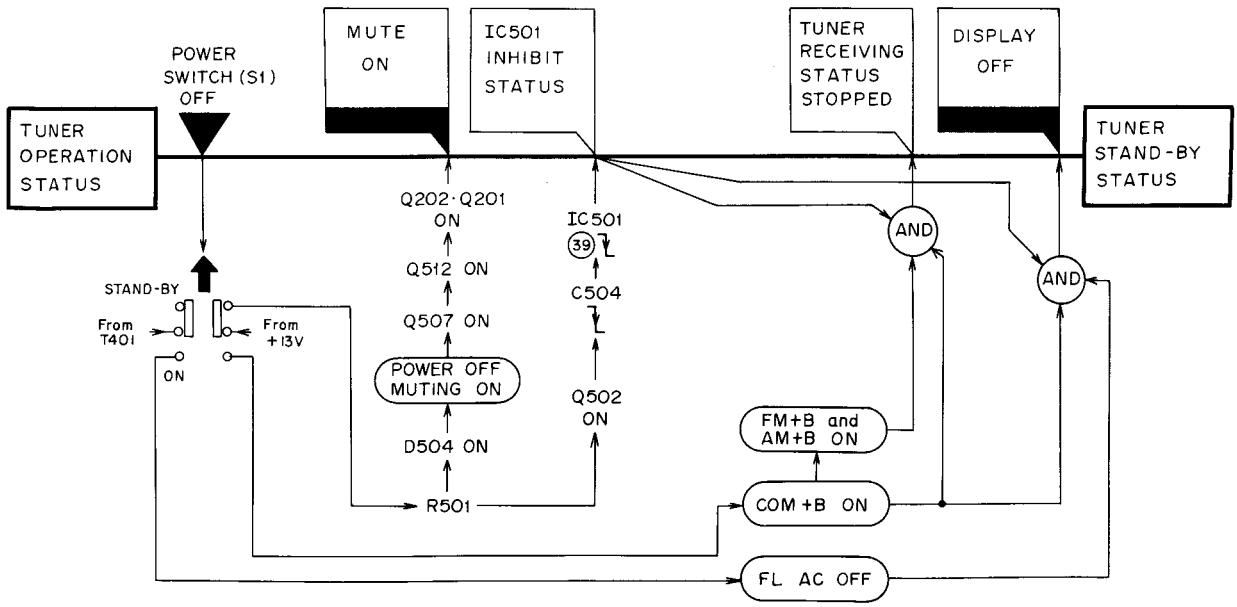


POWER OFF (AC POWER CORD DISCONNECTED)

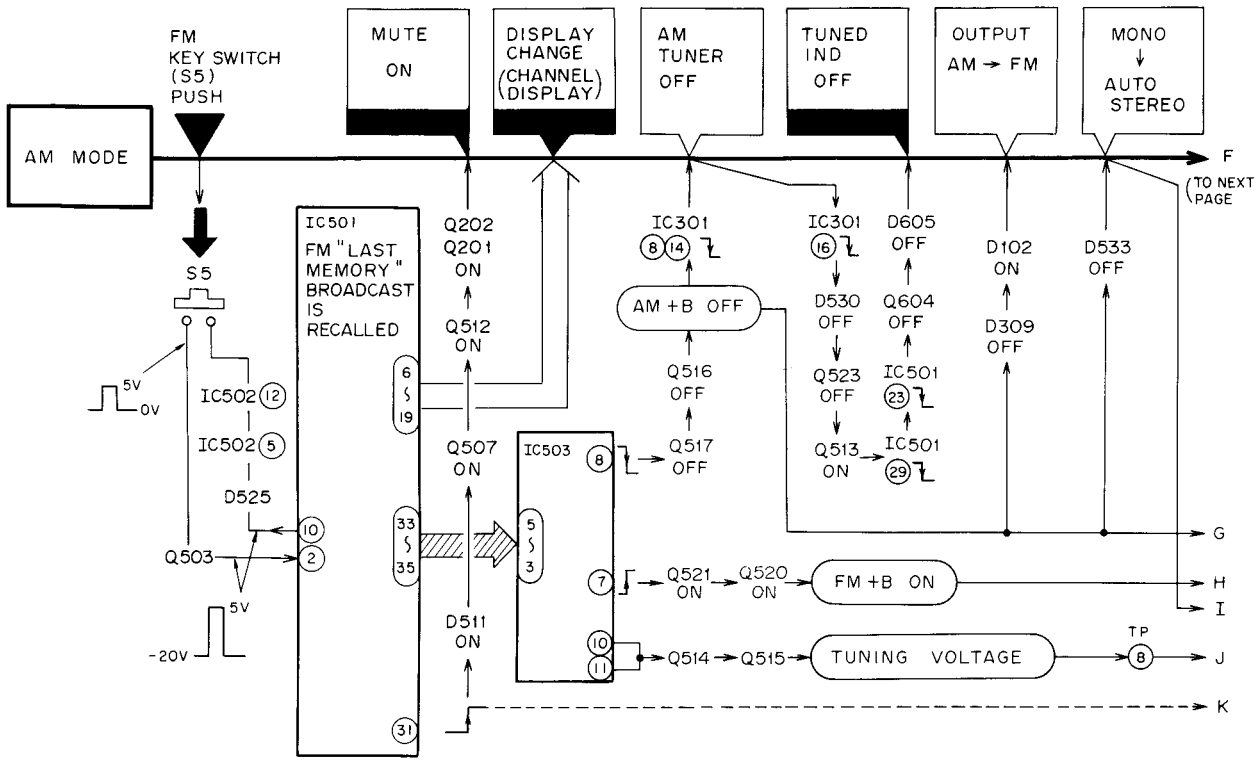




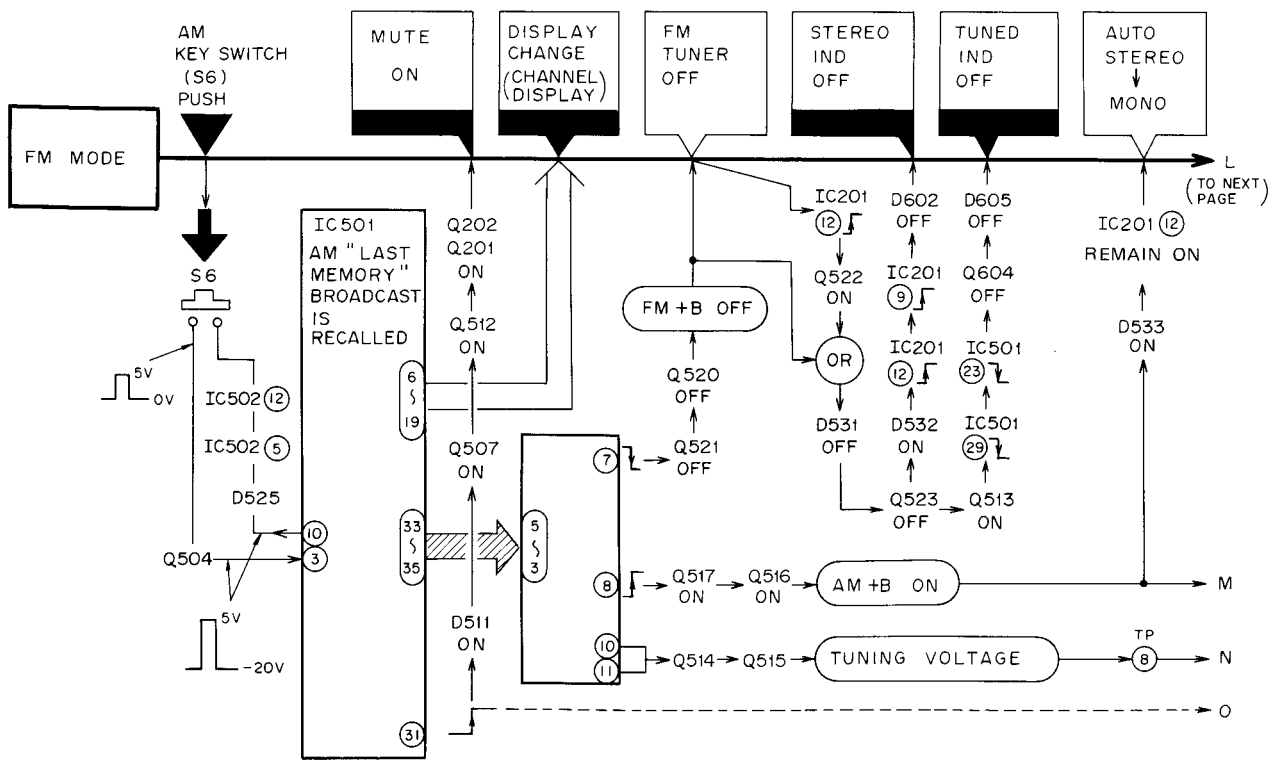
POWER OFF (POWER SWITCH OFF)



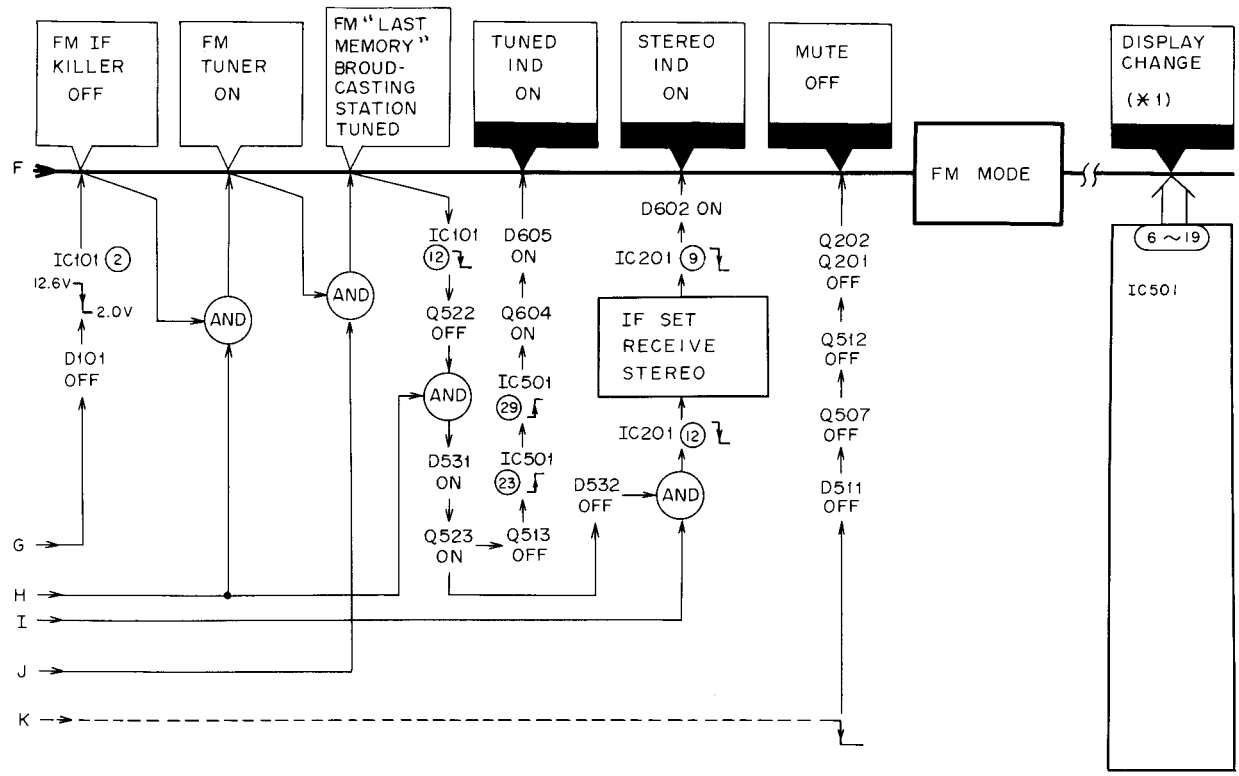
AM → FM

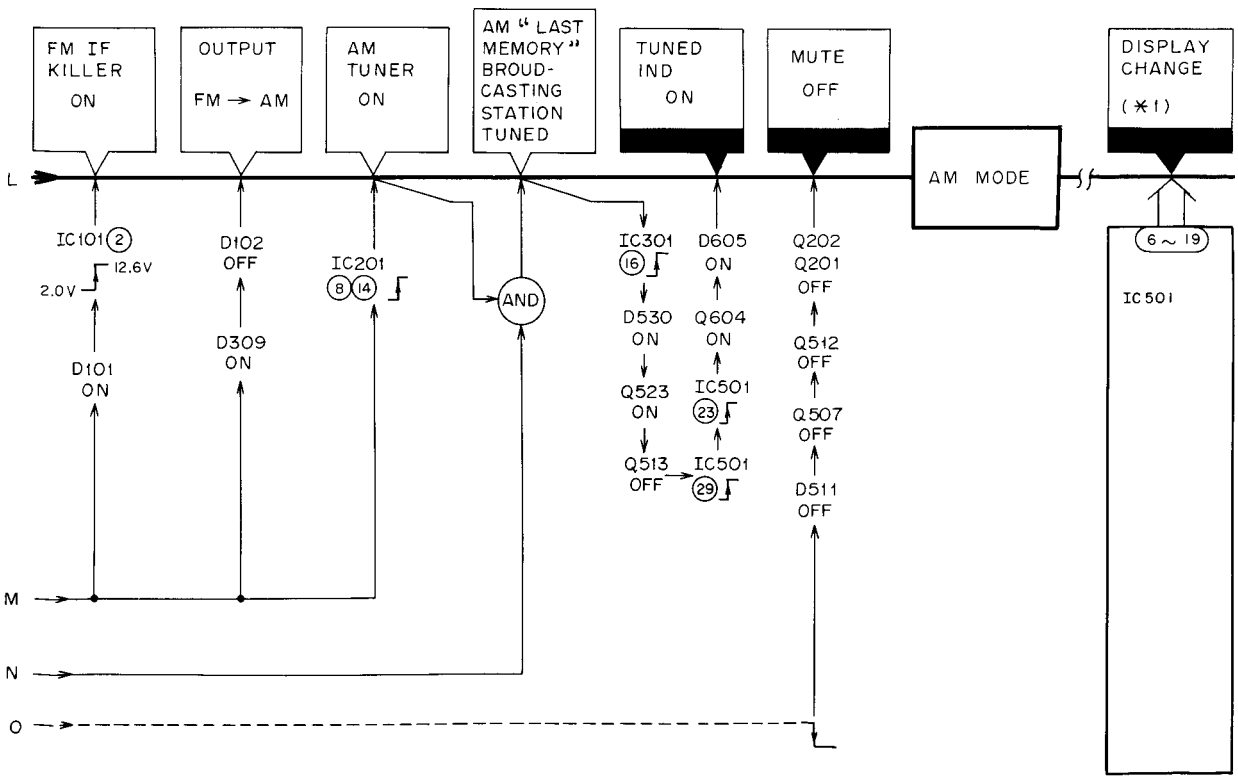


FM → AM

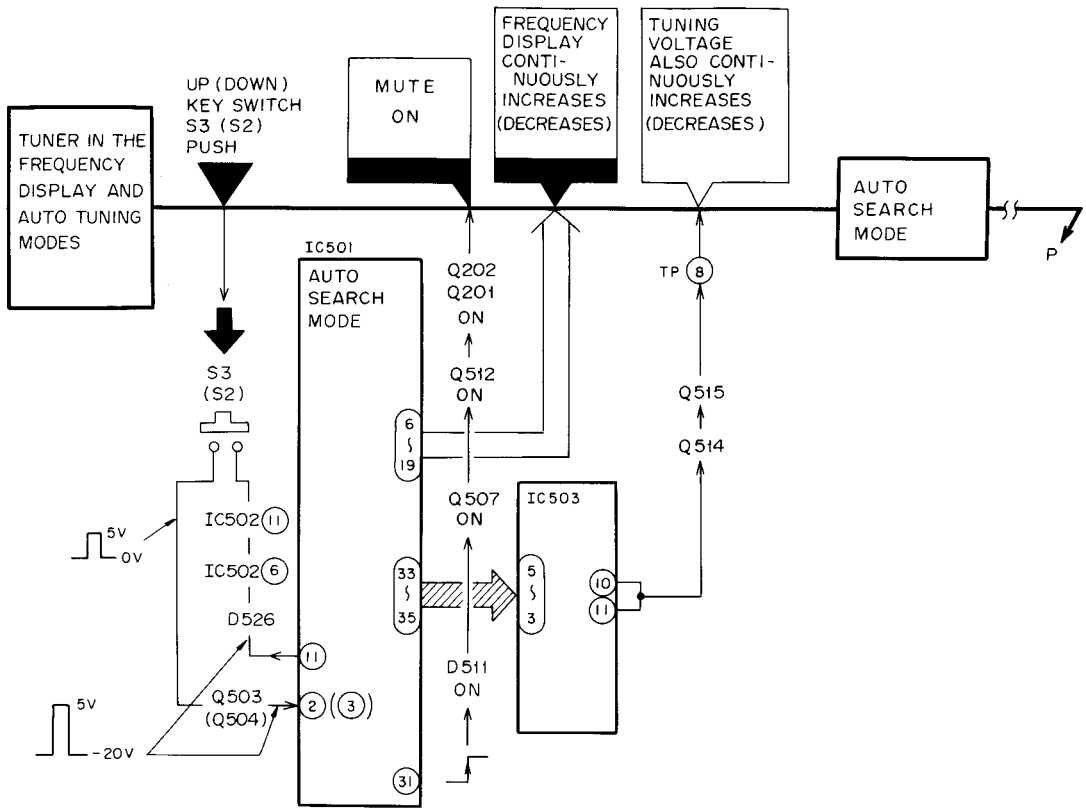


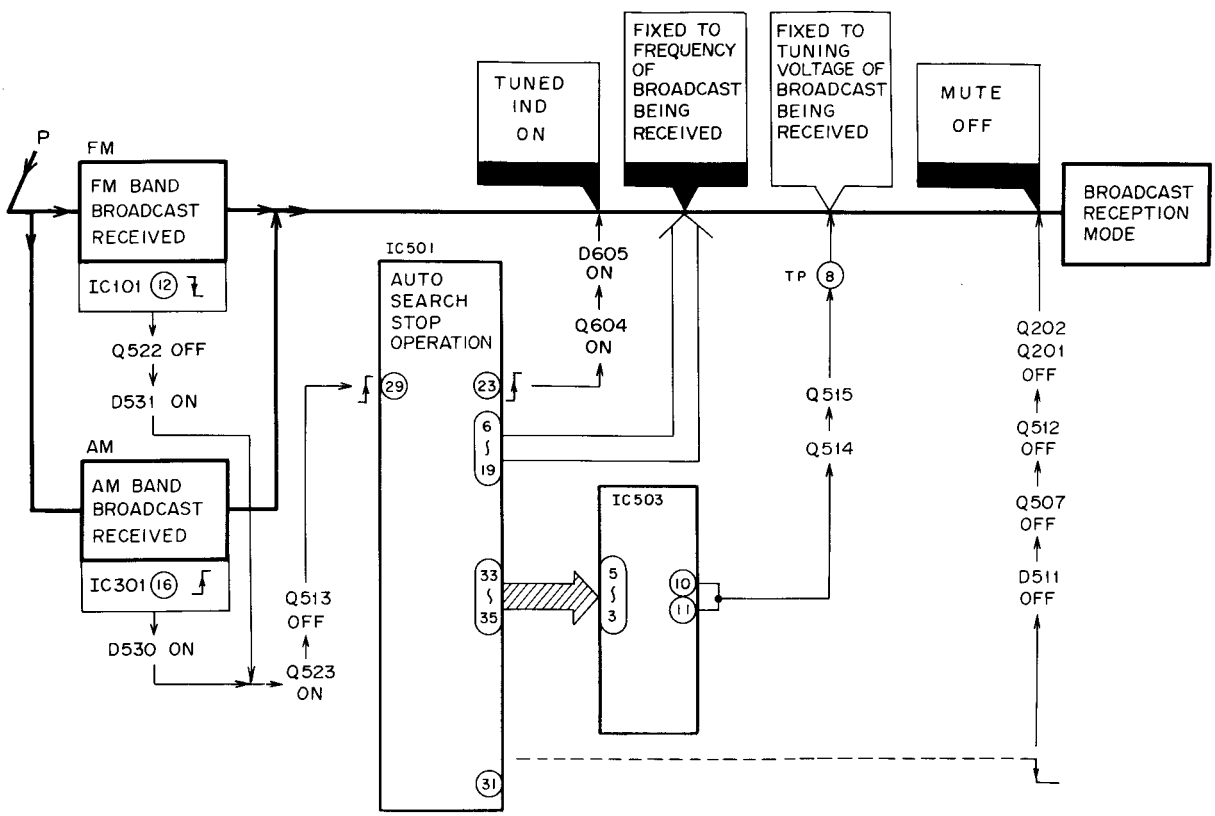
*1 : WHEN IN THE FREQUENCY DISPLAY MODE, THE DISPLAY SHOWS THE FREQUENCY. WHEN IN THE CHANNEL DISPLAY MODE, THE DISPLAY FIRST SHOWS THE FREQUENCY AND THEN RETURNS TO THE CHANNEL DISPLAY. (SEE FIG. 14 - 4).


FM IF KILLER OFF
FM TUNER ON
FM "LAST MEMORY" BROUD-CASTING STATION TUNED
TUNED IND ON
STEREO IND ON
MUTE OFF
DISPLAY CHANGE (*1)
FM MODE
F
IC101 (2)
12.6V
2.0V
D101 OFF
AND
AND
IC101 (12)
Q522 OFF
AND
D531 ON
Q523 ON
D605 ON
Q604 ON
IC501 (29)
IC501 (23)
Q513 OFF
D602 ON
IC201 (9)
IF SET RECEIVE STEREO
IC201 (12)
D532 OFF
AND
Q202 Q201 OFF
Q512 OFF
Q507 OFF
D511 OFF
6 ~ 19
IC501
G
H
I
J
K


FM IF KILLER ON
OUTPUT FM → AM
AM TUNER ON
AM "LAST MEMORY" BROUD-CASTING STATION TUNED
TUNED IND ON
MUTE OFF
DISPLAY CHANGE (*1)
AM MODE
L
IC101 (2)
12.6V
2.0V
D101 ON
D102 OFF
D309 ON
IC201 (8) (14)
AND
IC301 (16)
D530 ON
Q523 ON
Q513 OFF
D605 ON
Q604 ON
IC501 (23)
IC501 (29)
Q202 Q201 OFF
Q512 OFF
Q507 OFF
D511 OFF
6 ~ 19
IC501
M
N
O

AUTO SEARCH OPERATION





14. IC DESCRIPTION

TC9172P

Pin Function (Table 14-1)

Pin No.	Standard Voltage (V)	Pin Name	I/O	Function and Operation	
1	0	GND		GND	
2		REF	IN	Reference frequency input terminal	
3	H: 4.0 ~ 5.0 L: 0 ~ 1.0	SI		Input terminal for serial signal from control side	
4		CK		Clock input terminal for serial signal from control side	Read in of the SI terminal signal is performed at terminals CK and STB.
5		STB		Strobe input signal terminal for serial signal from control side	
6		NC (0T1)	OUT	Not used	General purpose output terminals
7		FM (0T2)		Emits H during the FM mode according to the command from PD2011A.	
8		AM (0T3)		Emits H during the AM mode according to the command from PD2011A.	
9		NC (0T4)		Not used	
10		D02		Phase comparator output terminals	
11		D01			
12		TEST	IN	Test mode control input terminal. Pull-down resistance included. During normal operation, this is open or connected to GND.	
13		AM IN		AM local oscillator frequency input terminal	
14		GND PRE		Prescaler GND	
15		FM IN	IN	FM local oscillator frequency input terminal	
16	5	VDD		Power supply voltage terminal	

PD2011A

Pin Function (Table 14-2)

Pin No.	Standard Voltage (V)	Pin Name	I/O	Function and Operation
1	0	GND		GND
2	H: −5 ~ 5.5	K0	IN	Key input ports. Composes the matrix together with D0 ~ D7 (see fig. 14-2 and table 14-3). Includes pull-down resistance to V_{FL}.
3	L: −22 ~ −17	K1		
4		K2		
5		K3		
6	H: 5.5	D0	OUT	Digit signal output terminal. Together, terminals a–h perform dynamic drive for the Fluorescent tube (see fig. 14-1). Composes the key matrix together with terminals K0 ~ K3 and P3-1 (see fig. 14-2 and table 14-3).
7	L: −22	D1		
8		D2		
9		D3		
10		D4		
11		D6		
12		D7		
13		a		Segment output terminals for the Fluorescent tube drive (see fig. 14-1).
14		b		
15		c		
16		d		
17		e		
18		f		
19		g		
20		h		
21	−22	V_{FL}		Fluorescent tube drive negative power supply voltage terminal
22	H: 3.5 ~ 5.0 L: 0 ~ 1.5	P3-1	IN	Key input port. Composes the matrix together with D0 ~ D7 (see fig. 14-2 and table 14-3).
23		TUNED IND (P3-2)	OUT	Tuned indicator output terminal. (active = H) H is not output unless a H signal is input at AUTO STOP (㉙) terminal.
24		SELECT IND (P3-3)		Select indicator output terminal. (active = H) Operates only when the memory composition mode is used for the top and bottom (see table 14-7).
				L: Top　H: Bottom
25		AUTO SCAN IND (P3-4)		Auto scan indicator output terminal. Emits a H signal during auto scan operation (see table 14-3).
26		CH/FRQ IND (P2-1)		Channel/frequency indicator output terminal. The output terminal that indicates the channel and frequency display modes (see table 14-3).
				L: Frequency display mode
				H: Channel display mode

Pin No.	Standard Voltage (V)	Pin Name	I/O	Function and Operation
27		AUTO/ MANUAL IND (P2-2)	OUT	Auto/manual indicator output terminal. The output terminal that indicates the auto and manual tuning modes (see table 14-3).
				L: Manual tuning mode
				H: Auto tuning mode
28		MODE MEMORY IND (P2-3)		Switches between H and L each time the key matrix "mode memory" switch is pressed (see table 14-3).
29	H: 3.3 ~ 5.0 L: 0 ~ 1.5	AUTO STOP (P2-4)	IN	Auto stop signal input terminal.
30		MODE MEMORY (P1-2)	OUT	Switches between H and L each time the key matrix "mode memory" switch is pressed (see table 14-3).
31		MUTE		Muting command signal output terminal. (Active = H)
32		TEST	IN	Test mode control input signal (includes pull-down resistance)
				L: Normal operation
				H: Test mode
33		STB	OUT	Strobe signal output terminal. Read in of the SI terminal signal and read out of the SO terminal signal are performed at terminals CK and STB.
34		CK		Serial signal clock output terminal
35		SO		Serial signal output terminal
36	H: 35 ~ 5.0 L: 0 ~ 1.5	SI	IN	Serial signal input terminal
37		REF	OUT	PLL reference frequency output terminal
38	H: 3.5 ~ 5.0 L: 0 ~ 1.5	$\overline{INT}$	IN	Initialize (system reset) signal input terminal (Active = L). Normally, system reset is activated when the V_{DD} terminal rises from 0V to 4.5V, so this terminal is used while fixed at the H level. *1)
39	H: 4.3 ~ 5.0 L: 0 ~ 2.7	$\overline{INT}$		Inhibit signal input terminal (Active = L)
				L: Inhibit mode
				H: Normal operation
40		$\overline{XT}$		7.2 MHz quartz oscillator connection terminal
41		XT		
42	5.5	V_{DD}		Positive power supply voltage terminal. Over 2V during the memory backup mode (when $\overline{INH}$ is L).

* If memory contents are lost due to replacement of PD2011A or the batteries, the unit is initialized in such a way that FM 87.5 MHz is written into all memory channels when power is switched on.

Display Generated by Signals a–h and D0 ~ D7 (Fig. 14-1)

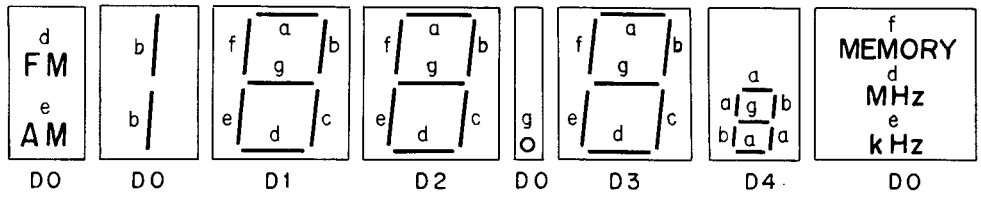


Fig. 14-1

Key Matrix

KEY MATRIX DIAGRAM (Fig. 14-2)

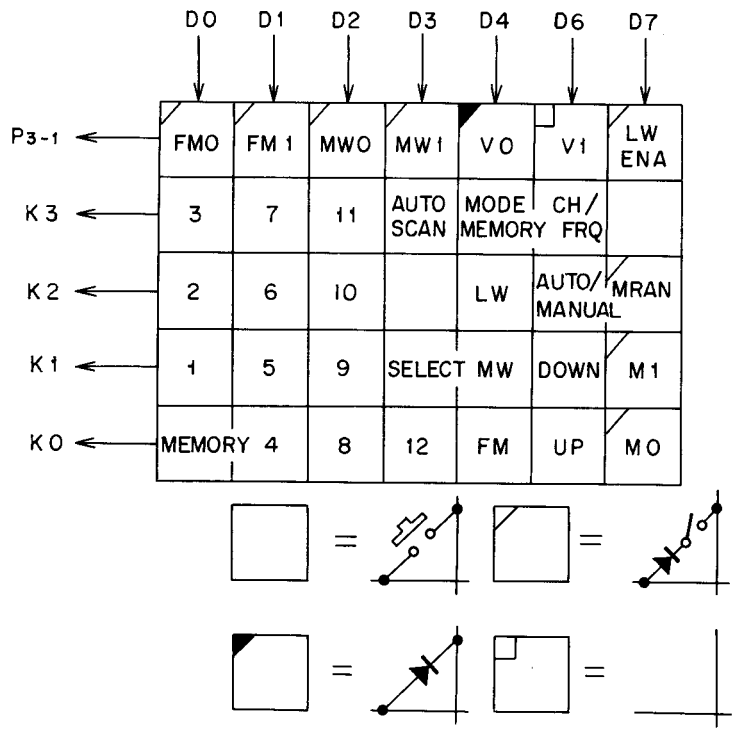


Fig. 14-2

EXPLANATION OF KEY MATRIX FUNCTIONS (Table 14-3)

Code	Key Matrix Function
V_0	Used when shorted at the diode.
V_1	Used when open.
FM_0	Sets the FM reception frequency band, tuning step, reference frequency and IF frequency band. (See table 14-4).
FM_1	
MW_0	Set the MW reception frequency band, tuning step, reference frequency and IF frequency band. (See table 14-5).
MW_1	
LW ENA	LW operation setting.
	Open: LW operation impossible mode.
	Short: LW operation possible mode. (see table 14-6)
M_{RAN}	Sets the memory composition mode (see table 14-7). The memory is a random access type having no relation to the tuned frequency band.
M_1	
M_0	
CH/FRQ	Used for switching between the channel and frequency display modes. Switches between the channel and frequency mode each time this key is pressed. When in the channel display mode, switching goes from CH to FRQ to CH. When in the frequency display mode, switching goes from CH to FRQ (see fig. 14-4). When in the channel mode, the CH/FRQ indicator ((26)) terminal goes to H.
AUTO/MANUAL	Used for switching between the auto and manual tuning modes. Switches between the auto and manual mode each time this key is pressed. The tuning mode is determined as shown in table 14-8 depending on the whether the unit is in the channel or frequency display mode. When in the auto tuning mode, the auto/manual indicator ((27)) goes to H.
AUTO SCAN	Auto scan operation is performed when this key is pressed. Broadcasts are searched from the low edge of the reception band. When a broadcast is reached and short time hold operation is performed (scanning is stopped for a few seconds and the unit switches to the memory mode). Auto scan operation ends at the high edge. When in the auto scan mode, the auto scan indicator ((25)) terminal goes to H.
MODE MEMORY	Each time this key is pressed, both the "mode memory" indicator ((28)) terminal and "mode memory" ((30)) terminal switch between H and L simultaneously.
FM	Press to switch to the FM mode.
MW	Press to switch to the MW mode.
LW	Press to switch to the LW mode. (Operates only when the LW ENA is shorted at the diode.)
UP	Activates the corresponding tuning operation depending on the current tuning mode (see table 14-8).
DOWN	
1 ~ 12	The station call key switches.
SELECT	Key switch for switching between the top and bottom of the station call. (see table 14-7). Switches between the top and bottom each time this key is pressed. When in the bottom mode, the select indicator ((24)) terminal goes to H. Operation is not possible when the M_{RAN} is opened.
MEMORY	When pressed, write-in to the memroy is possible for 5 seconds. During the write-in mode, the FL display "MEMORY" indicator is on.

FM Reception Band, Tuning Step, Reference Frequency and IF Frequency Band (Table 14-4)

FM_0	FM_1	Reception band frequency (MHz)	Tuning step (kHz)	Reference frequency (kHz)	IF frequency band (MHz)
OPEN	OPEN	76.0 ~ 90.0	100	25	−10.7
OPEN	SHORT	87.5 ~ 108.0			+10.7
SHORT	OPEN	87.50 ~ 108.00	50		
SHORT	SHORT	87.50 ~ 108.00			−10.7

MW Reception Band, Tuning Step, Reference Frequency and IF Frequency Band (Table 14-5)

MW_0	MW_1	Reception band frequency (kHz)	Tuning step (kHz)	Reference frequency (kHz)	IF frequency band (kHz)
OPEN	OPEN	522 ~ 1629	9	9	+450
OPEN	SHORT	522 ~ 1611			
SHORT	OPEN	531 ~ 1602			
SHORT	SHORT	530 ~ 1600	10	10	

LW Reception Band, Tuning Step, Reference Frequency and IF Frequency Band (Table 14-6)

Reception band frequency (kHz)	Tuning step (kHz)	Reference frequency (kHz)	IF frequency band (kHz)
153 ~ 281	1	1	+450

Memory Composition Modes (Table 14-7)

M_{RAN}	M_1	M_0	Memory Composition mode	Top	Bottom
SHORT	OPEN	OPEN	Top/bottom 20	1 ~ 10	11 ~ 20
		SHORT	Top/bottom 16	1 ~ 8	9 ~ 16
	SHORT	OPEN	Top/bottom 12	1 ~ 6	7 ~ 12
		SHORT	Top/bottom 10	1 ~ 5	6 ~ 10
OPEN	SHORT	OPEN	Top only 12	1 ~ 12	–
		SHORT	Top only 10	1 ~ 10	–

Tuning Modes (Table 14-8)

CH/FRQ	AUTO/MANUAL	TUNING MODE
FREQUENCY	MANUAL	MANUAL SEARCH
	AUTO	AUTO SEARCH
CHANNEL	MANUAL	MANUAL MEMORY SCAN
	AUTO	AUTO MEMORY SCAN

FM Reception Band, Tuning Step, Reference Frequency and IF Frequency Band (Table 14-4)

FM_0	FM_1	Reception band frequency (MHz)	Tuning step (kHz)	Reference frequency (kHz)	IF frequency band (MHz)
OPEN	OPEN	76.0 ~ 90.0	100	25	−10.7
OPEN	SHORT	87.5 ~ 108.0			+10.7
SHORT	OPEN	87.50 ~ 108.00	50		
SHORT	SHORT	87.50 ~ 108.00			−10.7

MW Reception Band, Tuning Step, Reference Frequency and IF Frequency Band (Table 14-5)

MW_0	MW_1	Reception band frequency (kHz)	Tuning step (kHz)	Reference frequency (kHz)	IF frequency band (kHz)
OPEN	OPEN	522 ~ 1629	9	9	+450
OPEN	SHORT	522 ~ 1611			
SHORT	OPEN	531 ~ 1602			
SHORT	SHORT	530 ~ 1600	10	10	

LW Reception Band, Tuning Step, Reference Frequency and IF Frequency Band (Table 14-6)

Reception band frequency (kHz)	Tuning step (kHz)	Reference frequency (kHz)	IF frequency band (kHz)
153 ~ 281	1	1	+450

Memory Composition Modes (Table 14-7)

M_{RAN}	M_1	M_0	Memory Composition mode		Top	Bottom
SHORT	OPEN	OPEN	Top/bottom	20	1 ~ 10	11 ~ 20
		SHORT	Top/bottom	16	1 ~ 8	9 ~ 16
	SHORT	OPEN	Top/bottom	12	1 ~ 6	7 ~ 12
		SHORT	Top/bottom	10	1 ~ 5	6 ~ 10
OPEN	SHORT	OPEN	Top only	12	1 ~ 12	–
		SHORT	Top only	10	1 ~ 10	–

Tuning Modes (Table 14-8)

CH/FRQ	AUTO/MANUAL	TUNING MODE
FREQUENCY	MANUAL	MANUAL SEARCH
	AUTO	AUTO SEARCH
CHANNEL	MANUAL	MANUAL MEMORY SCAN
	AUTO	AUTO MEMORY SCAN

• MANUAL SEARCH

Each time the UP (DOWN) key is pressed, the tuned frequency goes up (or down) by one tuning step. If the UP (DOWN) key is held down, the tuned frequency continuously goes up (or down).

• AUTO SEARCH

When the UP (DOWN) key is pressed, the tuned frequency goes up (or down) until a broadcast is located. It LW ENA is open, a broadcast is judged to be present for FM and MW when a H signal is received for more than about 100msec. at the auto stop (㉙) terminal (The actual operation of PD2011A is to confirm whether or not the unit is in the same mode 100 msec. after the"broadcast exists" response has been received. If the mode is unchanged, AUTO SEARCH is stopped.). If LW ENA is shorted, an FM broadcast is judged to be present when a H signal is received for more than 100 msec. at the auto stop (㉙) terminal. For MW and LW, a broadcast is judged to be present when the IF frequency band becomes 450kHz (for more than about 100 msec.). At this time, the IF frequency band count is performed by the PLL IC. The result is sent to PD2011A as serial data. (TC9171P has this mode; TC9172P does not.)

• MANUAL MEMORY SCAN

Each time the UP (DOWN) key is pressed, the next higher (or lower) memory channel is recalled. During the "—CH" display (when tuning using a method other than station call and the unit is set to the channel display mode, this display appears), pressing the UP key recalls channel 1 and pressing the DOWN key recalls channel 16.

• AUTO MEMORY SCAN

When the UP (DOWN) key is pressed, each memory channel is recalled for about five seconds in ascending (or descending) order rising. Operation stops when the process returns to the channel from which memory scan was begun (see fig. 14-3). When the UP key is pressed during the "—CH" display, auto memory scan operation is performed in ascending order beginning from channel 1. When the DOWN key is pressed, this operation is performed in the reverse order from channel 16.

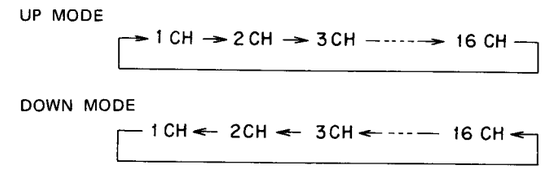
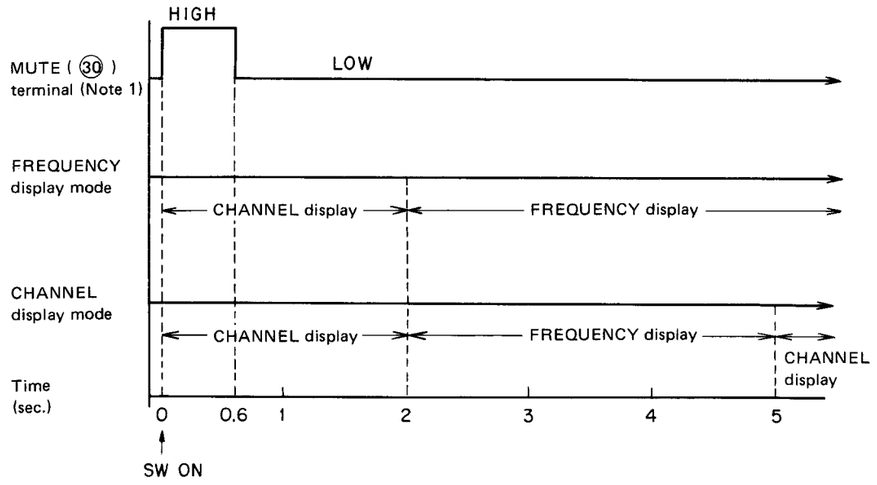


Fig. 14-3 Auto memory scan

Display timing when a band selector key (FM/MW/LW) or station call key (channel) is pressed (Fig. 14-4).



(Note 1): When the same band select key or the same station call key is pressed, there is no MUTE output.

15. FOR HE TYPE

CONTRAST OF MISCELLANEOUS PARTS

The TX-1060/HE, and TX-1060(BK)/HE are the same as the TX-1060(BK)/KU with the exception of following sections.

Mark	Symbol & Description	Part No.			Remarks
		TX-1060 (BK)/KU	TX-1060/HE	TX-1060(BK)/HE	
	Complex assembly	GWM-414	GWM-427	GWM-427	
⚠ ★★	Fuse FU401 (T400mA/250V)	...	AEK-407	AEK-407	
⚠	AC power cord	ADG-073	ADG-071	ADG-071	
	Packing case	AHE-498	AHE-499	AHE-498	
	Bonnet case	ANE-549	ANE-550	ANE-549	
	Front panel	ANY-034	ANY-035	ANY-034	
	Sheet panel	ANZ-016	ANZ-018	ANZ-016	
	Operating instructions (English)	ARB-685	...	...	
	Operating instructions (English/German/French/Italian)	...	ARE-128	ARE-128	

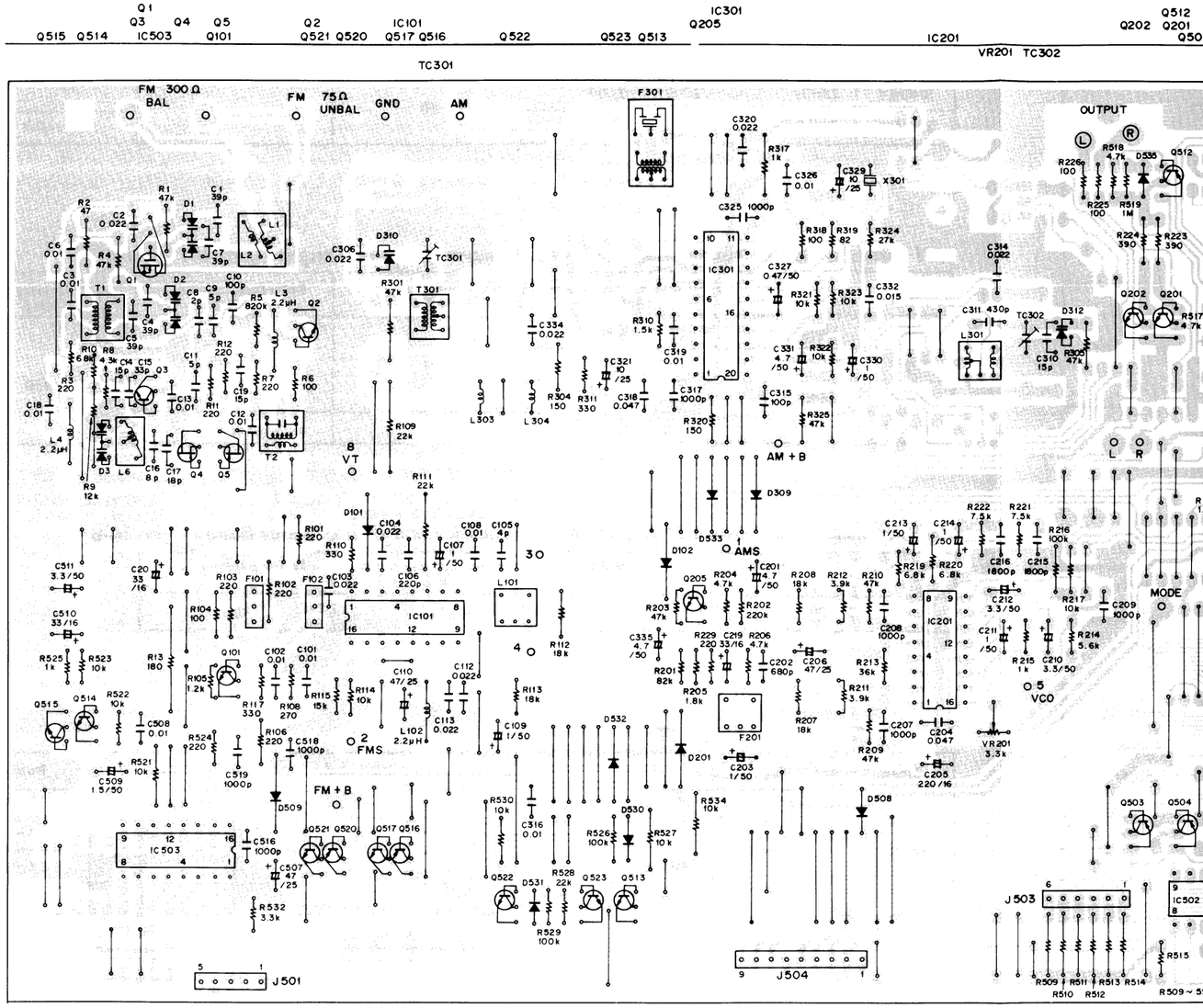
COMPLEX ASSEMBLY

The complex assembly GWM-427 (for HE type) is the same as the GWM-414 (for KU type) with the exception of following sections.

Mark	Symbol & Description	Part No.		Remarks
		GWM-414	GWM-427	
★★	Q509	RN2203 (DTA124ES) (2SA1346)	... ...	
★	D517	...	1SS131	
★	D518	1SS131	...	
★	D528	1SS131	...	
★	S19 Slide switch	ASH-034	...	(CHANNEL STEP)
⚠ ★★	T401 Power transformer (AC 120V)	ATS-132	...	
⚠ ★★	T401 Power transformer (AC 220V/240V)	...	ATS-096	
	C207, C208	CQMA152J50	CQMA102J50	
	R112	RD1/8PM123J	PD1/8PM183J	
⚠	R404 (2.2MΩ 1/2W)	ACN-209	...	
	Terminal (ANTENNA)	AKA-017	AKA-018	

P.C. BOARD PATTERN (FOR HE TYPE)

COMPLEX ASSEMBLY (GWM-427)



IC101	PA3001 - A	Q1	2SK241	Q502,513,517,521~523	RN1203
IC201	HA12016	Q2	2SC2786	Q503 ~ 506	RN2203
IC301	LA1247	Q3,101	2SC2668	Q516,520	RN2201
IC401	NJM78M13A	Q4,5	2SK161	D1~3	1SV147
IC501	PD2011A	Q201,202,205,507, Q514,515	2SC2458	D101,102,309,501~509, D511,515~517,519~526, D530~533,535,536	1SS131
IC502	TD62504A				
IC503	TC9172P	Q501,512	2SA1048	D201,401~405,407,408	S5566
				D310,312	SVC321C2/D2
				D409	RD22EB
				D410	RD4.7EB
				D411	RD6.2EB

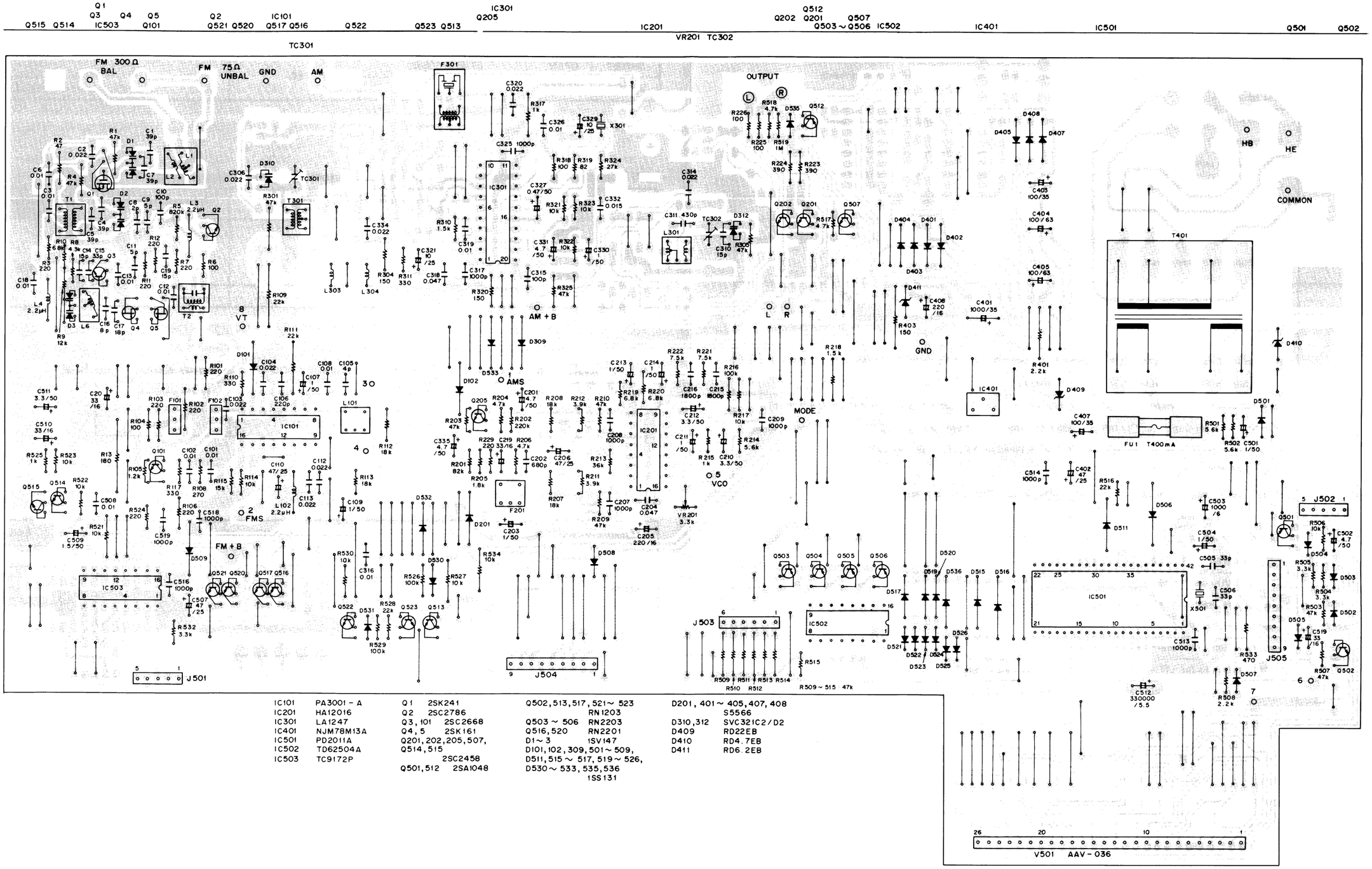
xception of

Remarks

the excep-

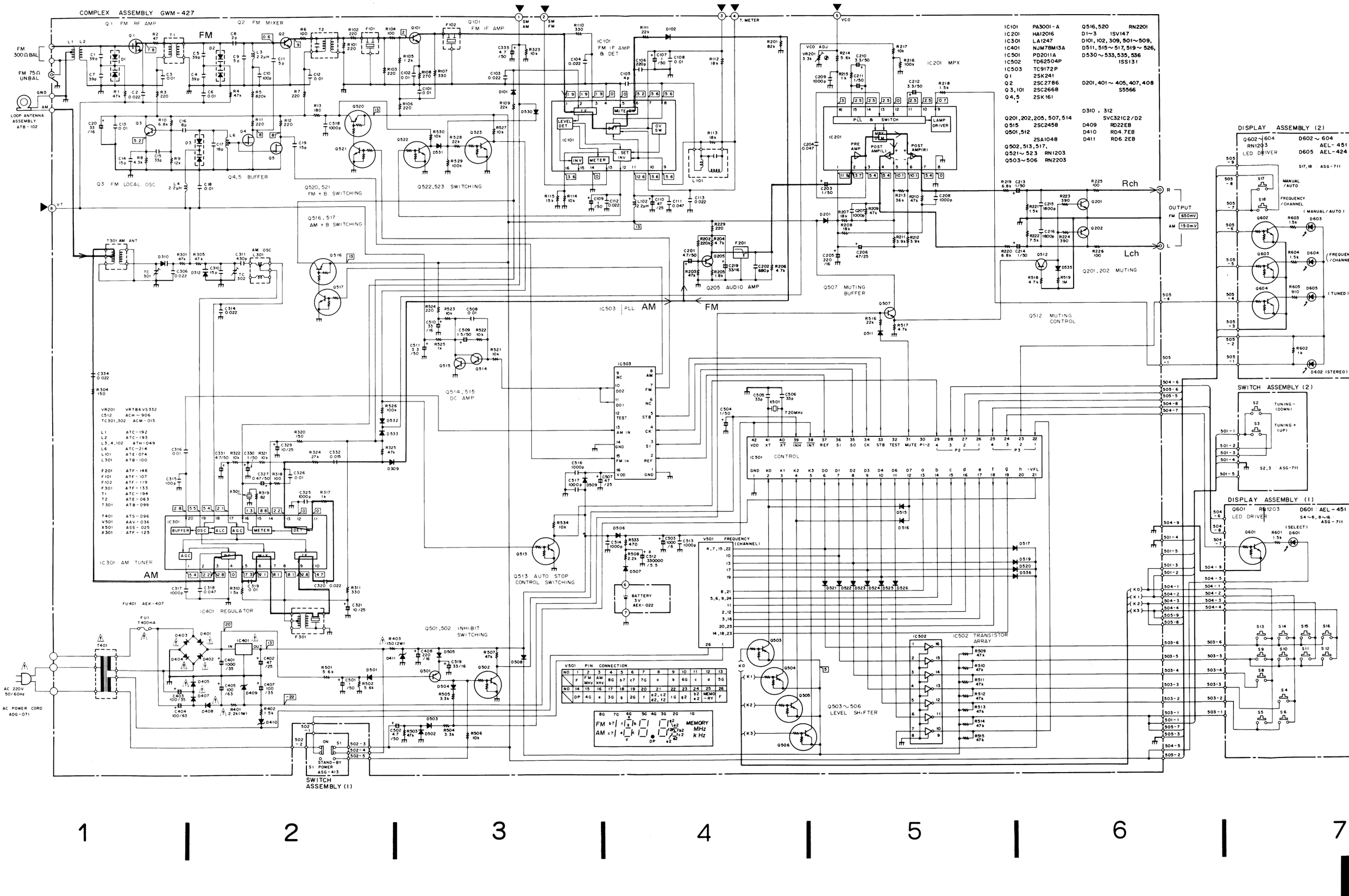
P.C. BOARD PATTERN (FOR HE TYPE)

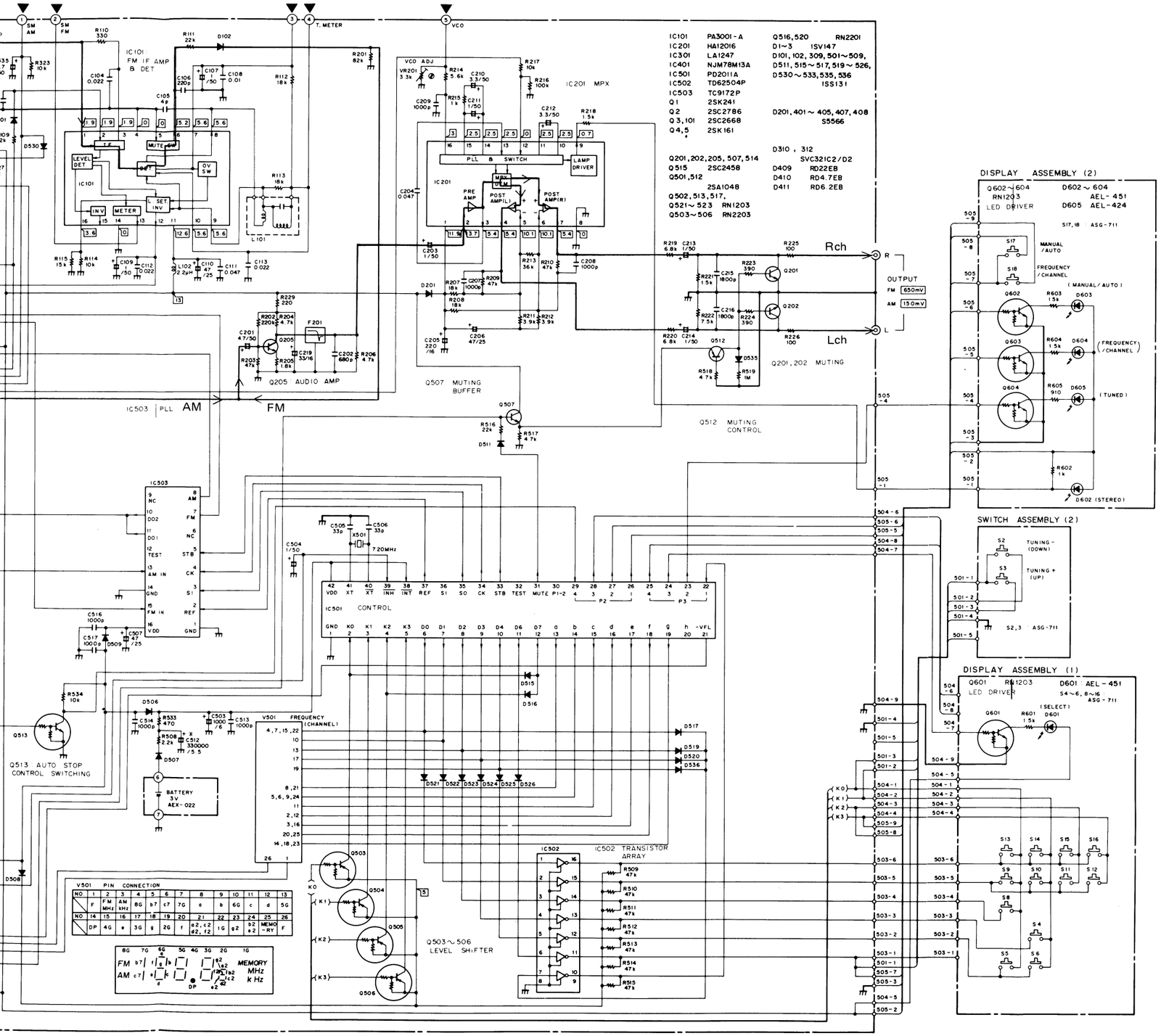
COMPLEX ASSEMBLY (GWM-427)



IC101	PA3001 - A	Q1	2SK241	Q502, 513, 517, 521 ~ 523	RN1203	D201, 401 ~ 405, 407, 408	S5566
IC201	HA12016	Q2	2SC2786	Q503 ~ 506	RN2203	D310, 312	SVC321C2/D2
IC301	LA1247	Q3, 101	2SC2668	Q516, 520	RN2201	D409	RD22EB
IC401	NJM78M13A	Q4, 5	2SK161	D1 ~ 3	1SV147	D410	RD4.7EB
IC501	PD2011A	Q201, 202, 205, 507, Q514, 515	2SC2458	D101, 102, 309, 501 ~ 509, D511, 515 ~ 517, 519 ~ 526, D530 ~ 533, 535, 536	1SS131	D411	RD6.2EB
IC502	TD62504A	Q501, 512	2SA1048				
IC503	TC9172P						

SCHEMATIC DIAGRAM (FOR HE TYPE)





1. RESISTORS:
Indicated in Ω, ¼W, ⅛W,±5% tolerance unless otherwise noted k; kΩ, M; MΩ, (F); ±1%, (G); ±2%, (K); ±10%, (M); ±20% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE CURRENT.
: DC voltage (V) at no input signal
mV: Signal voltage at FM 1kHz * 75kHz DEV.

4. OTHERS:
: Signal route.
: Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

SWITCHES:
SWITCH ASSEMBLY (1)
S1 POWER ON — STAND-BY
SWITCH ASSEMBLY (2)
S2 TUNING - (DOWN)
S3 TUNING + (UP)
DISPLAY ASSEMBLY (1)
S4 SELECT (STATION MODE)
S5 FUNCTION FM
S6 FUNCTION AM
S8 STATION CALL 8/16
S9 STATION CALL 4/12
S10 STATION CALL 5/13
S11 STATION CALL 6/14
S12 STATION CALL 7/15
S13 MEMORY
S14 STATION CALL 1/9
S15 STATION CALL 2/10
S16 STATION CALL 3/11
DISPLAY ASSEMBLY (2)
S17 MANUAL / AUTO
S18 FREQUENCY / CHANNEL
The underlined indicates the switch position.

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.

ADDITIONAL

Service Manual

PIONEER

D38

ORDER NO.
ARP-779-0

FM/AM DIGITAL SYNTHESIZER TUNER

TX-1060 NEZ
TX-1060(BK) NEZ

- **For servicing these types, please refer to the TX-1060, TX-1060(BK) service manual (ARP-776) with the exception of this additional service manual.**
- This additional service manual is applicable to the TX-1060/NEZ and TX-1060 (BK)/NEZ.

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS [USA] INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
TEL: (800) 421-1404, (800) 237-0424
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 2740 Beveren, Belgium TEL: 03/775·28·08
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia
TEL: (03) 580-9911

FW © AUG. 1985 Printed in Japan.

1. SPECIFICATIONS

FM Tuner Section

Frequency range ..... 87.5 MHz to 108 MHz
Usable Sensitivity ..... 11.2 dBf, IHF (1.0 μV/75 Ω)
50 dB Quieting Sensitivity
..... Stereo; 36.2 dBf, IHF (17.8 μV/75 Ω)
Sensitivity (DIN) ..... Mono; 0.9 μV/75 Ω
Stereo; 30 μV/75 Ω
Signal-to-Noise Ratio ..... Mono; 78 dB (at 80 dBf)
Stereo; 76 dB (at 80 dBf)
Signal-to Noise Ratio (DIN) ..... Mono; 66 dB
Stereo; 60 dB
Distortion (at 80 dBf) ..... Stereo; 0.35% (1 kHz)
Alternate Channel Selectivity ..... 67 dB (400 kHz)
Stereo Separation ..... 40 dB (1 kHz)
Frequency Response ..... $^{+0.5}_{-1.5}$ dB (30 Hz to 15 kHz)
Image Response Ratio ..... 80 dB
IF Response Ratio ..... 110 dB
AM Suppression Ratio ..... 50 dB
Antenna Input ..... 75 Ω unbalanced

AM Tuner Section

Frequency range ..... 531 kHz to 1,602 kHz
Sensitivity (IHF, Loop antenna) ..... 300 μV/m
Selectivity ..... 22 dB
Signal-to-Noise Ratio ..... 52 dB
Image Response Ratio ..... 40 dB
IF Response Ratio ..... 50 dB
Antenna ..... Loop Antenna

Audio Section

Output Level
FM (100% MOD) ..... 650 mV/3.6 kΩ
AM (30% MOD) ..... 150mV/3.6 kΩ

Miscellaneous

Power Requirements ..... AC 220 Volts, 50/60 Hz
Power Consumption ..... 9.5 W
Dimensions ..... 420 (W) x 60 (H) x 219 (D) mm
16-9/16 (W) x 2-3/8 (H) x 8-5/8 (D) in
Weight (without package) ..... 2.4 kg (5 lb 5 oz)

Furnished Parts

FM T-type Antenna 1
AM Loop Antenna 1
Connection Cord with Pin Plugs 1
Operating Instructions 1
Adaptor Plug 1

NOTE:
Specifications and design subject to possible modification without notice due to improvements.

2. CONTRAST OF MISCELLANEOUS PARTS

NOTES:

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

The TX-1060/NEZ and TX-1060 (BK)/NEZ are the same as the TX-1060 (BK)/KU with the exception of the following sections.

Mark	Symbol & Description	Part No.			Remarks
		TX-1060(BK)/KU	TX-1060/NEZ	TX-1060 (BK)/NEZ	
	Complex assembly	GWM-414	GWM-433	GWM-433	
⚠	AC power cord	ADG-073	ADG-095	ADG-095	
⚠ ★★	FU401 Fuse (T400mA/250V)	...	AEK-407	AEK-407	
	PAL socket	...	AKX-206	AKX-206	
	Bonnet case	ANE-549	ANE-601	ANE-600	
	Front panel	ANY-034	ANY-035	ANY-034	
	Sheet panel	ANZ-016	ANZ-018	ANZ-016	
	Matching unit	...	AKX-090	AKX-090	
	Operating instructions (English)	ARB-685	...	...	
	Operating instructions (German)	...	ARC-111	ARC-111	
	Packing case	AHE-498	AHE-499	AHE-498	
	Screw (Terminal (ANTENNA) for grounding)	...	ABA-115	ABA-115	
	Screw (Bonnet case)	...	ABA-274	...	
	Nut (PAL socket)	...	NKX2FNI	NKX2FNI	
	Washer (PAL socket)	...	WAX3F176N050	WAX3F176N050	

3. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560Ω	*56 × 10¹*	*561 ..... RD¼PS* 5 6 1	*J*
47kΩ	*47 × 10³*	*473 ..... RD¼PS* 4 7 3	*J*
0.5Ω	*0R5*	*..... RN2H* 0 R 5	*K*
1Ω	*010*	*..... RS1P* 0 1 0	*K*

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 × 10¹*	*5621 .... RN¼SR* 5 6 2 1	*F*

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Miscellaneous Parts

Mark	Symbol & Description	Part No.
	Complex assembly	GWM-433
	Front end assembly	AWB-065
	Switch assembly (1)	Non supply
	Switch assembly (2)	Non supply
	Display assembly (1)	Non supply
	Display assembly (2)	Non supply
	PAL socket	AKX-206
⚠ ★★	FU401 Fuse(T400mA/250V)	AEK-407
⚠	AC power cord	ADG-095
	Battery (3V)	AEX-022

Complex Assembly (GWM-433)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC201	HA12016
★★	IC301	LA1247
⚠ ★★	IC401	NJM78M13A
★★	IC101	PA3001-A
★★	IC501	PD2011A
★★	IC503	TC9172P
★★	IC502	TD62504P
★★	Q502, Q513, Q517, Q521~Q523	RN1203 (DTC124ES) (2SC3400)
★★	Q516, Q520	RN2201 (DTA143ES)
★★	Q503~Q506	RN2203 (DTA124ES) (2SA1346)
★★	Q501, Q512	2SA1048 (JA 101) (2SA1115) (2SA933S)
★★	Q201, Q202, Q205, Q507, Q514, Q515	2SC2458 (JC501) (2SC1740S) (2SC2603)
★★	Q101	2SC2668
★	D409	RD22EB (HZ22EB)
★	D410	RD4.7EB (HZ 4.7 EB)
★	D411	RD6.2 EB (HZ6.2EB)
★	D310, D312	SVC321C2 (SVC321D2)
★	D401~D405, D407, D408	S5566 (11E2)
★	D201	S5566 (11E2)
★	D101, D102, D309, D501~D509, D511, D515~D517, D519~D526, D530~D533, D535, D536	1SS131

COILS, TRANSFORMERS, AND FILTERS

Mark	Symbol& Description	Part No.
	L301 AM OSC coil	ATB-100
	L101 FM DET coil	ATE-074
	L102 Inductor (2.2 μH)	ATH-049
	T301 AM ANT transformer	ATB-099
⚠ ★	T401 Power transformer (220V)	ATS-096
	F101 FM ceramic filter	ATF-107
	F102 FM ceramic filter	ATF-119
	F301 AM ceramic filter	ATF-133
	F201 Beat eliminate filter	ATF-146
	F401 Line filter	ATF-163

CAPACITOR

Mark	Symbol& Description	Part No.
	C512 (0.33F/5.5V)	ACH-906
	TC301, TC302 Trimmer	ACM-015
	C310	CCDCH150J50
	C505, C506	CCDCH330J50
	C105	CCDSL040C50
	C315	CCDSL101J50
	C106	CCDSL221J50
	C327	CEASR47M50
	C107, C109, C203, C211, C213, C214, C330, C501, C504	CEAS010M50
	C509	CEAS1R5M50
	C321, C329	CEAS100M25
	C403, C407	CEAS101M35
	C404, C405	CEAS101M63
	C503	CEAS102M6
	C205, C408	CEAS221M16
	C210, C212, C511	CEAS3R3M50
	C20, C219, C510, C519	CEAS330M16
	C201, C331, C335, C502	CEAS4R7M50
	C110, C206, C402, C507	CEAS470M25
	C401	CEA102M35L
	C317, C325, C513, C514, C516~C518	CKDYB102K50
	C202	CKDYB681K50
	C101, C102, C108, C316, C319, C326, C508	CKDYF103Z50
	C103, C104, C112, C113, C306, C314, C320, C334	CKDYF223Z50
	C204, C318	CKDYF473Z50
	C111	CKDYX473M25
	C207, C208	CQMA102J50
	C332	CQMA153K50
	C215, C216	CQMA182K50
	C209	CQSA102J50
	C311	CQSA431J50

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
★	VR201 Semi-fixed (3.3 kΩ)	VRTB6VS332
⚠	R401	RS1LMF222J
⚠	R403	RS2LMF151J
	R13	RD1/4PM181J
	Other resistors	RD1/8PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	Terminal (ANTENNA)	AKA-023
	Terminal (OUTPUT)	AKB-093
★	V501 Fluorescent tube	AAV-036
★	X501 Cristal resonator (7.20 MHz)	ASS-025
★	X301 Ceramic resonator (450 kHz)	ATF-125
	Front end assembly	AWB-065
	Screw	PBZ30P060FMC

Front End Assembly (AWB-065)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q102	2SC2668
★★	Q105	2SC2786-L
★★	Q101, Q103, Q104	2SK241-Y
★	D101~D104	1SV147

COILS AND TRANSFORMERS

Mark	Symbol & Description	Part No.
	L101 FM ANT coil	ATC-192
	L104 FM OSC coil	ATC-214
	L103 FM RF coil	ATC-247
	L102 FM tuning coil	ATC-248
	L105, L106 Inductor (2.2 μH)	ATH-049
	T101 FM RF transformer	ATC-194
	T102 FM Matching transformer	ATE-063

CAPACITORS

Mark	Symbol & Description	Part No.
	TC101 Trimmer	ACM-014
	C115	CCDCH080D50
	C113	CCDCH150J50
	C114	CCDCH330J50
	C101	CCDRH100D50
	C105	CCDRH330J50
	C102, C104, C106	CCDRH390J50
	C108, C110	CCDSL010C50
	C109	CCDSL020C50
	C111	CCDSL101J50
	C117	CCDSL150J50
	C116	CCDTH180J50
	C103, C112, C118, C119	CKDYF103Z50
	C107	CKDYF223Z50

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
	All resistors	RD1/8PM□□□J

Switch Asse

SWITCH

Mark	Symbo
★★	S1

Switch Asse

SWITCHES

Mark	Symbo
★★	S2, S3

Display Asse

SEMICONDUC

Mark	Symbo
★★	Q602~
★	D605
★	D602~

SWITCHES

Mark	Symbo
★★	S17, S (MAN FREQ

RESISTORS

NOTE: When into co

Mark	Symb
	All re

art No.
SC2458
C501)
SC1740S)
SC2603)
SC2668
D22EB
Z22EB)
D4.7EB
Z 4.7 EB)
D6.2 EB
Z6.2EB)
VC321C2
VC321D2)
566
1E2)
566
1E2)
S131

RS

Part No.
ATB-100
ATE-074
ATH-049
ATB-099
ATS-096
ATF-107
ATF-119
ATF-133
ATF-146
ATF-163

CAPACITOR

Mark	Symbol& Description	Part No.
	C512 (0.33F/5.5V)	ACH-906
	TC301, TC302 Trimmer	ACM-015
	C310	CCDCH150J50
	C505, C506	CCDCH330J50
	C105	CCDSL040C50
	C315	CCDSL101J50
	C106	CCDSL221J50
	C327	CEASR47M50
	C107, C109, C203, C211, C213, C214, C330, C501, C504	CEAS010M50
	C509	CEAS1R5M50
	C321, C329	CEAS100M25
	C403, C407	CEAS101M35
	C404, C405	CEAS101M63
	C503	CEAS102M6
	C205, C408	CEAS221M16
	C210, C212, C511	CEAS3R3M50
	C20, C219, C510, C519	CEAS330M16
	C201, C331, C335, C502	CEAS4R7M50
	C110, C206, C402, C507	CEAS470M25
	C401	CEA102M35L
	C317, C325, C513, C514, C516~C518	CKDYB102K50
	C202	CKDYB681K50
	C101, C102, C108, C316, C319, C326, C508	CKDYF103Z50
	C103, C104, C112, C113, C306, C314, C320, C334	CKDYF223Z50
	C204, C318	CKDYF473Z50
	C111	CKDYX473M25
	C207, C208	CQMA102J50
	C332	CQMA153K50
	C215, C216	CQMA182K50
	C209	CQSA102J50
	C311	CQSA431J50

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
★	VR201 Semi-fixed (3.3 kΩ)	VRTB6VS332
⚠	R401	RS1LMF222J
⚠	R403	RS2LMF151J
	R13	RD1/4PM181J
	Other resistors	RD1/8PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	Terminal (ANTENNA)	AKA-023
	Terminal (OUTPUT)	AKB-093
★	V501 Fluorescent tube	AAV-036
★	X501 Cristal resonator (7.20 MHz)	ASS-025
★	X301 Ceramic resonator (450 kHz)	ATF-125
	Front end assembly	AWB-065
	Screw	PBZ30P060FMC

Front End Assembly (AWB-065)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q102	2SC2668
★★	Q105	2SC2786-L
★★	Q101, Q103, Q104	2SK241-Y
★	D101~D104	1SV147

COILS AND TRANSFORMERS

Mark	Symbol & Description	Part No.
	L101 FM ANT coil	ATC-192
	L104 FM OSC coil	ATC-214
	L103 FM RF coil	ATC-247
	L102 FM tuning coil	ATC-248
	L105, L106 Inductor (2.2 μH)	ATH-049
	T101 FM RF transformer	ATC-194
	T102 FM Matching transformer	ATE-063

CAPACITORS

Mark	Symbol & Description	Part No.
	TC101 Trimmer	ACM-014
	C115	CCDCH080D50
	C113	CCDCH150J50
	C114	CCDCH330J50
	C101	CCDRH100D50
	C105	CCDRH330J50
	C102, C104, C106	CCDRH390J50
	C108, C110	CCDSL010C50
	C109	CCDSL020C50
	C111	CCDSL101J50
	C117	CCDSL150J50
	C116	CCDTH180J50
	C103, C112, C118, C119	CKDYF103Z50
	C107	CKDYF223Z50

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
	All resistors	RD1/8PM□□□J

Switch Assembly (1)

SWITCH

Mark	Symbol & Description	Part No.
★★	S1 Push switch (POWER)	ASG-413

Switch Assembly (2)

SWITCHES

Mark	Symbol & Description	Part No.
★★	S2, S3 Tact switch (TUNING (–, +))	ASG-711 (ASG-703)

Display Assembly (1)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q602~Q604	RN1203 (DTC124ES) (2SC3400)
★	D605 LED (GREEN)	AEL-424
★	D602~D604 LED (RED)	AEL-451

SWITCHES

Mark	Symbol & Description	Part No.
★★	S17, S18 Tact switch (MANUAL/AUTO, FREQUENCY/CHANNEL)	ASG-711 (ASG-703)

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
	All resistors	RD1/8PM□□□J

Display Assembly (2)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	Q601	RN1203 (DTC124ES) (2SC3400)
★	D601 LED (RED)	AEL-451

SWITCHES

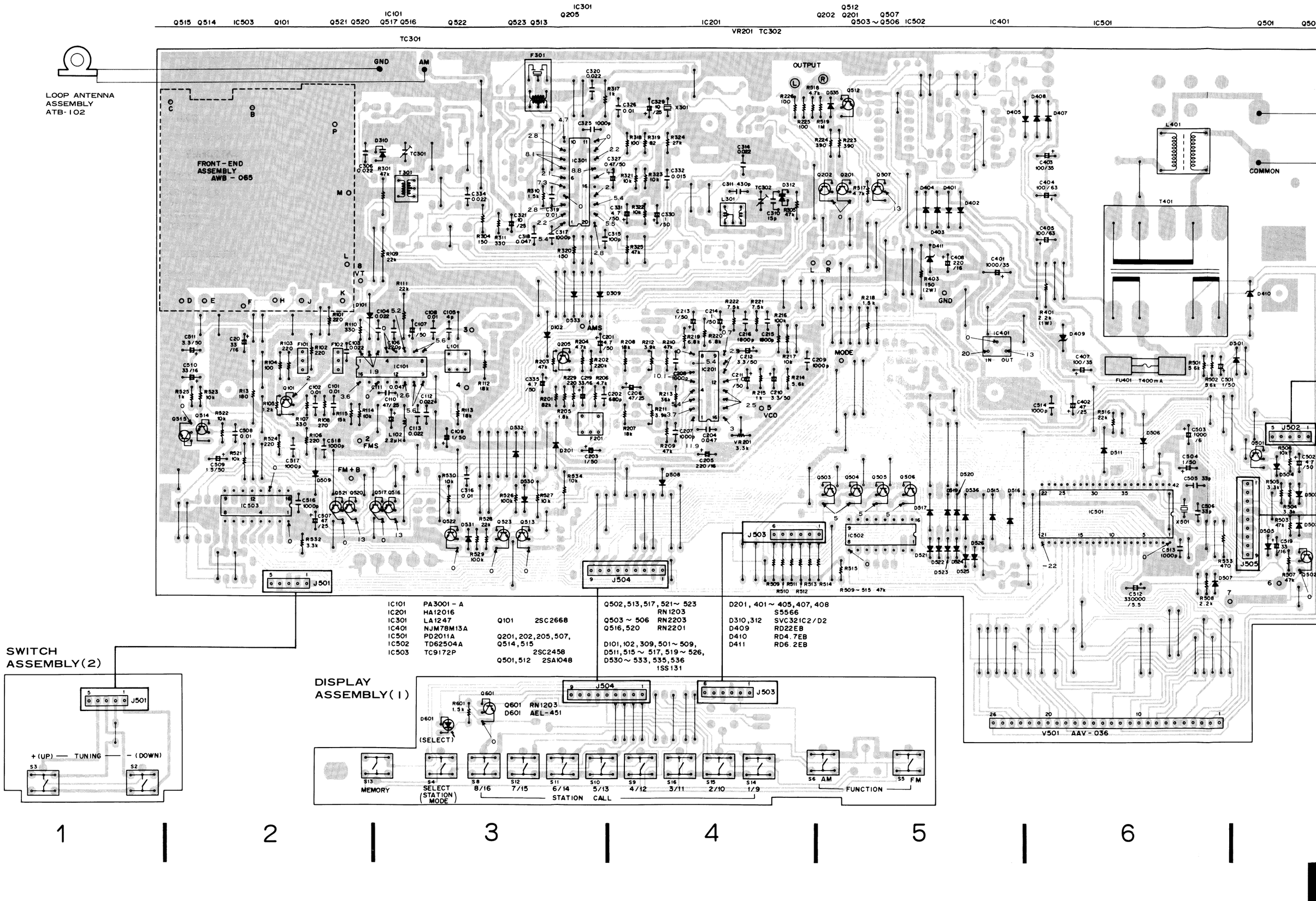
Mark	Symbol & Description	Part No.
★★	S4~S6, S8~S16 Tact switch (FUNCTION (FM, AM), STATION CALL (1/9~8/16), SELECT, MEMORY)	ASG-711 (ASG-703)

RESISTOR

Mark	Symbol & Description	Part No.
	R601	RD1/8PM152J

4. P.C. BOARDS CONNECTION DIAGRAM

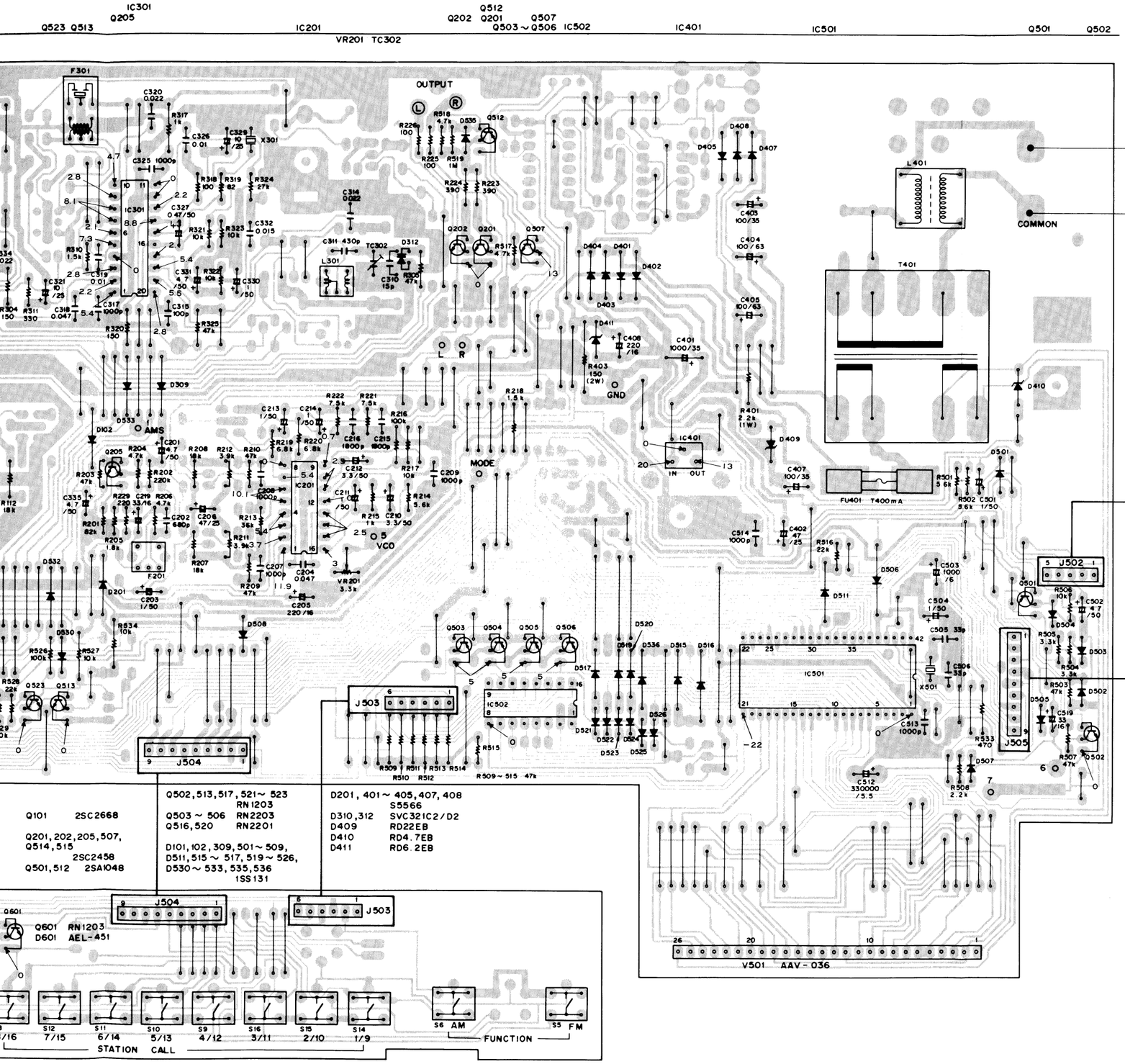
COMPLEX ASSEMBLY(GWM-433)

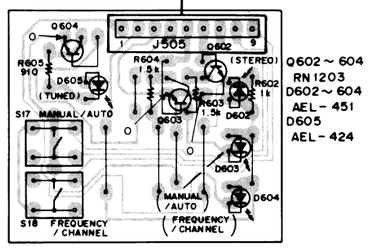


IC101	PA3001-A	Q101	2SC2668
IC201	HA12016	Q201,202,205,507, Q514,515	2SC2458
IC301	LA1247	Q501,512	2SA1048
IC401	NJM78M13A	Q502,513,517,521~523	RN1203
IC501	PD2011A	Q503~506	RN2203
IC502	TD62504A	Q516,520	RN2201
IC503	TC9172P	Q601	RN1203
		D601	AEL-451

D101,102,309,501~509, D511,515~517,519~526, D530~533,535,536	1SS131
D201,401~405,407,408	S5566
D310,312	SVC321C2/D2
D409	RD22EB
D410	RD4.7EB
D411	RD6.2EB

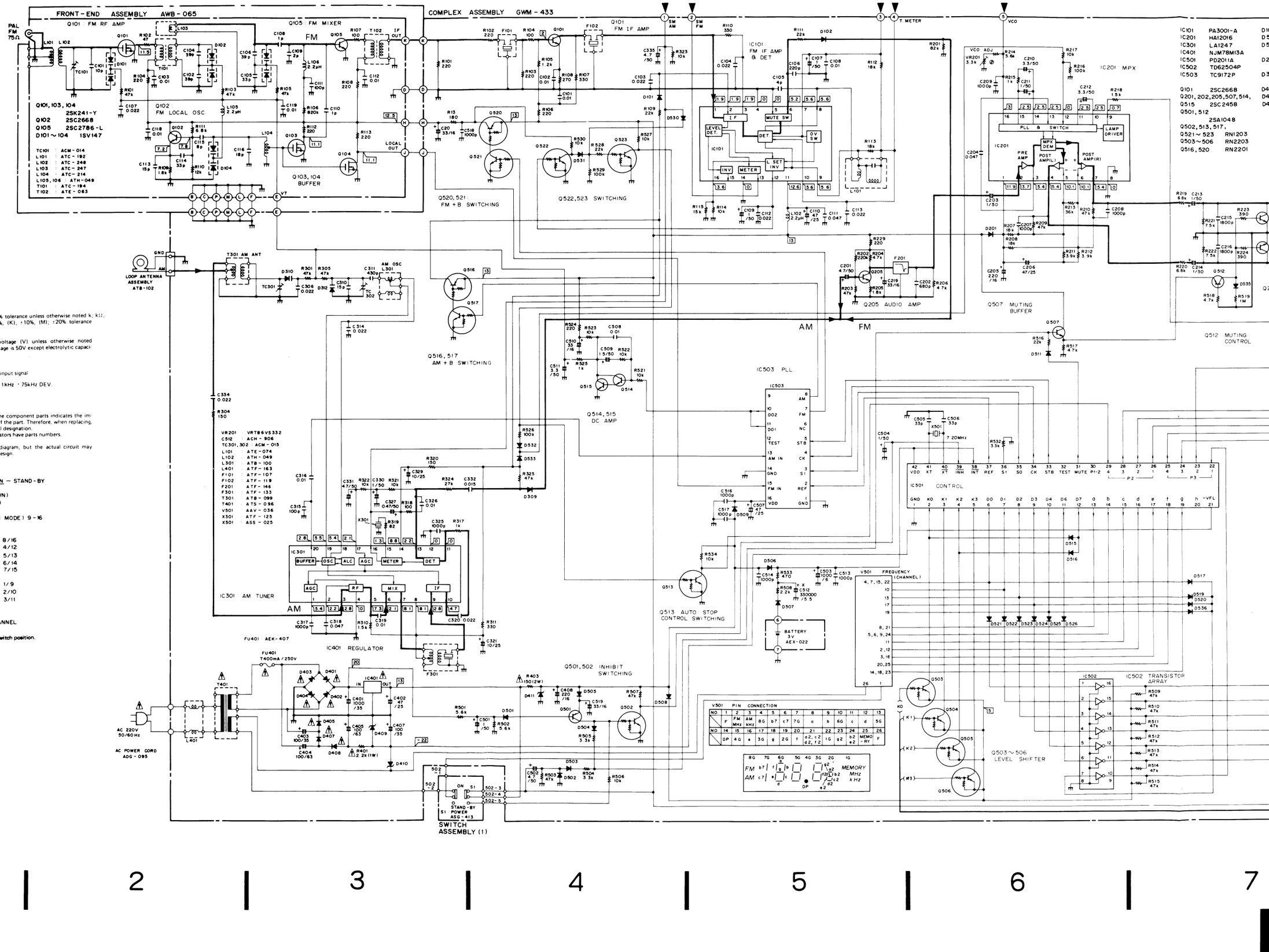
COMPLEX ASSEMBLY(GWM-433)





DISPLAY ASSEMBLY(2)

5. SCHEMATIC DIAGRAM



1. RESISTORS:
Indicated in Ω, ¼W, 1/8 W, ±5% tolerance unless otherwise noted k; kΩ, M; MΩ, (F); ±1%, (G); ±2%, (K), ±10%, (M); ±20% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE CURRENT:
DC voltage (V) at no input signal
mV: Signal voltage at FM 1kHz · 75kHz DEV.

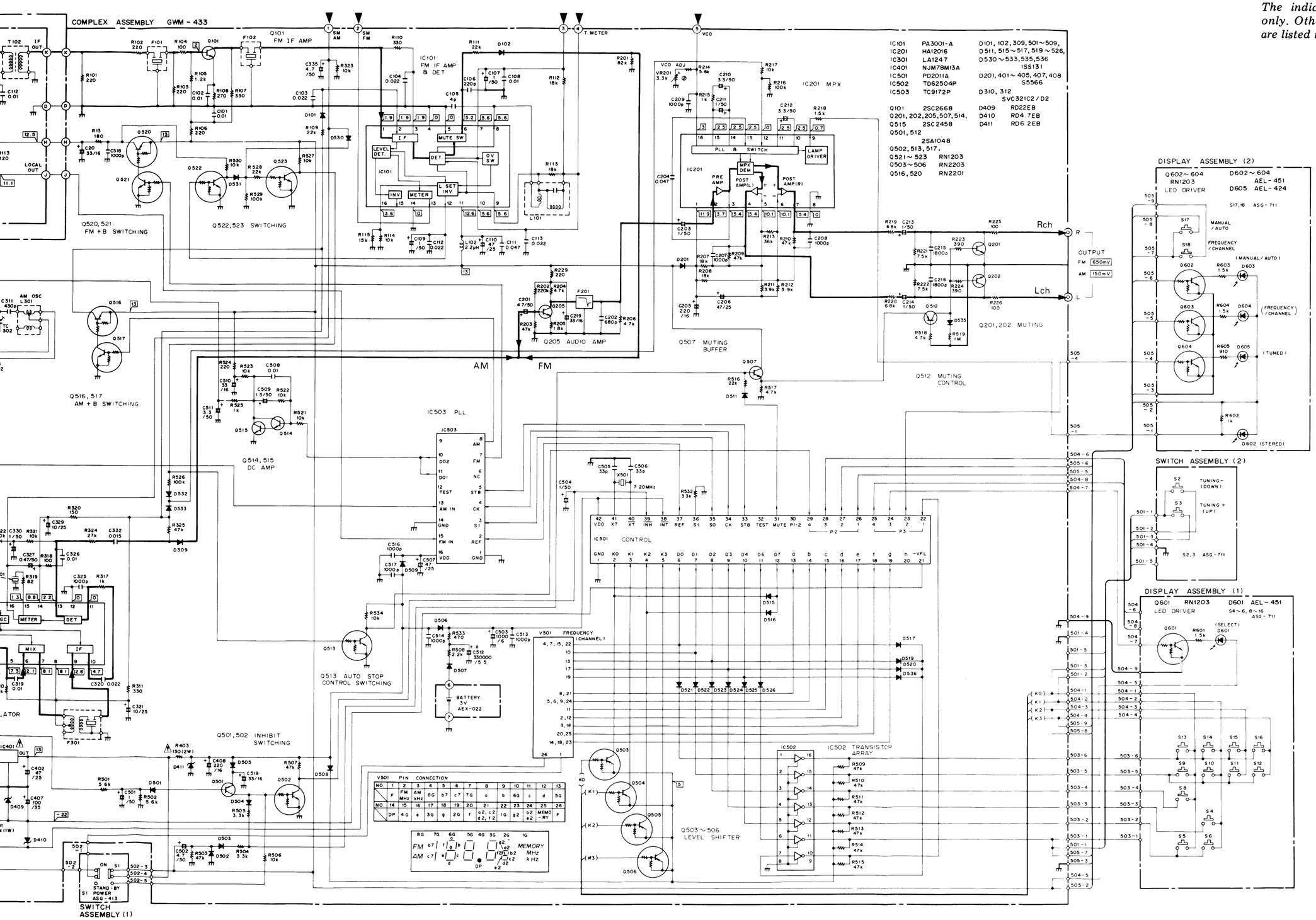
4. OTHERS:
: Signal route.
: Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

SWITCHES:
SWITCH ASSEMBLY (1)
S1 POWER ON - STAND-BY
SWITCH ASSEMBLY (2)
S2 : TUNING - (DOWN)
S3 : TUNING + (UP)
DISPLAY ASSEMBLY (1)
S4 : SELECT (STATION MODE) 9-16
S5 : FUNCTION FM
S6 : FUNCTION AM
S8 : STATION CALL 8/16
S9 : STATION CALL 4/12
S10 : STATION CALL 5/13
S11 : STATION CALL 6/14
S12 : STATION CALL 7/15
S13 : MEMORY
S14 : STATION CALL 1/9
S15 : STATION CALL 2/10
S16 : STATION CALL 3/11
DISPLAY ASSEMBLY (2)
S17 : MANUAL / AUTO
S18 : FREQUENCY / CHANNEL

The underlined indicates the switch position.

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.



6. ADJUSTMENTS

(Adjustment point with no specification are located on the part excluding Front End Assembly (AWB-065).)

FM Tuner Section

- Connect the FM signal generator (FM SG) to the FM ANTENNA 75Ω terminal through a 75Ω dummy antenna.
- Set the TX-1060 to the FM band.

(*1) Tune the FM SG to the TX-1060.
(*2) Connect the FM multiplex stereo signal generator to the FM SG external modulator terminal. Set the modulation to Main 1kHz/L+R/±68.25kHz deviation, Pilot 19kHz/±6.75kHz deviation.

Step	FM SG (1kHz, ±75kHz deviation) Frequency	FM SG (1kHz, ±75kHz deviation) Level	TX-1060 Frequency display	Adjustment point	Adjustment procedure
1	90.0MHz (*1)	20dB	90.0MHz	(*5) L102, T101, L103 (AWB-065)	Adjustment until DC voltage between terminal no. 2 (FMS) and ground is maximum.
2	106.0MHz (*1)	20dB	106.0MHz	TC101, T101, L103 (AWB-065)	
3	90.0MHz (*1)	20dB	90.0MHz	(*5) L102 (AWB-065)	
4	Repeat step 2 and 3 until the DC voltage between no. 2 (FMS) and GND is maximum. Step 3 should always be the last step performed.				
5	98.0MHz (*1)	20dB	98.0MHz	T102 (AWB-065)	Adjustment until DC voltage between terminal no. 2 (FMS) and ground is maximum.
6	98.0MHz (*1)	66dB	98.0MHz	L101	Adjust DC voltage between terminal no. 3 and no. 4 to 0V ± 60mV (*4).
7	98.0MHz (*1) not modulation	66dB	98.0MHz	VR201	Adjust signal between terminal no. 5 (VCO) and ground to 76kHz (within ±150Hz).
8	98.0MHz (*1) Stereo modulation (*2) (Main=1kHz, L or R)	86dB	98.0MHz	T102 (AWB-065) (within ±90°)	Adjust until distortion at OUTPUT L and R terminal is equaly minimum.
9	98.0MHz (*1) Stereo modulation (*2)	38dB	98.0MHz	R115	If the STEREO indicator and TUNED indicator are not on, remove R115.

(*4) The TUNED indicator should go off within 20kHz to 40kHz when moving away (in either direction) from a tuned frequency.

AM Tuner Section

- Connect the furnished AM loop antenna between terminals AM ANTENNA and GND.
- Connect the AM signal generator (AM SG) to the AM ANTENNA terminal through a 10kΩ resistor.
- Set the TX-1060 to the AM band.

(*3) Tune the AM SG to the TX-1060.

Step	AM SG (400Hz, 30% modulation) Frequency	AM SG (400Hz, 30% modulation) Level	TX-1060 Frequency display	Adjustment point	Adjustment procedure
1	No signal		531kHz	L301	1.3±0.1V DC between terminal E (VT) (AWB-065) and ground.
2	No signal		1602kHz	TC302	10±0.5V DC between terminal E (VT) (AWB-065) and ground.
3	Repeat steps 1 and 2 until both specifications are correct.				
4	603kHz (*3)	76dB	603kHz	T301	Adjust until DC voltage between terminal no. 1 (AMS) and ground is maximum.
5	1395kHz (*3)	76dB	1395kHz	TC301	
6	Repeat steps 4 and 5 until maximum sensitivity is attained.				

6. RÉGLAGE

(le point de réglage avec spécifications est placé sur la pièce, sauf poru l´ensemble de l´extrémité avant (AWB-065).)

Section du tuner FM

- Raccorder le générateur de signal FM (FM SG) à la borne de 75Ω de FM ANTENNA à travers l´antenne fictive de 75Ω.
- Régler le TX-1060 sur la bande FM.

(*1) Accorder le FM SG au TX-1060.
(*2) Raccorder le générateur de signal stéréo multiplex FM à la borne du modulateur externe FM SG. Régler la modulation à la déviation 1 kHz/L R/±68,25, déviation pilote 19 kHz/±6,75 kHz.

Etape	FM SG (déviation 1 kHz, ±75 kHz) Fréquence	FM SG (déviation 1 kHz, ±75 kHz) Niveau	Affichage de fréquence TX-1060	Point de réglage	Procédure de réglage
1	90,0MHz (*1)	20dB	90,0MHz	(*5) L102, T101, L103 (AWB-065)	Régler jusqu'à ce que la tension CC entre la borne No. 2 (FMS) et la terre soit sur une valeur maximum.
2	106,0MHz (*1)	20dB	106,0MHz	TC101, T101, L103 (AWB-065)	
3	90,0MHz (*1)	20dB	90,0MHz	(*5) L102 (AWB-065)	
4	Répéter les étapes (2) et (3) jusqu'à ce que la tension CC entre les bornes No. 2 (FMS) et la terre soit sur une valeur maximum. L'étape 3 doit étre celle qui sera exécutée en dernier.				
5	98,0MHz (*1)	20dB	98,0MHz	T102 (AWB-065)	Régler jusqu'à ce que la tension entre la borne No. 2 (FMS) et la terre soit une valeur maximum.
6	98,0MHz (*1)	66dB	98,0MHz	L101	Régler la tension CC entre la borne No. 3 et celle No. 4 sur 0V (*4).
7	98,0MHz (*1) Sans modulation	66dB	98,0MHz	VR201	Régler le signal entre la borne No. 5 (VCO) et la terre sur 76 kHz (dane les limites de ±150 kHz)
8	98,0MHz (*1) Modulation stéréo (*2) (Principal = 1 kHz, L ou R)	86dB	98,0MHz	T102 (AWB-065) (Dans les limites de ±90°)	Régler jusqu'à ce que la distorsion à la borne L et R OUTPUT (sortie) soit également minimum.
9	98,0MHz (*1) Modulation stéréo	38dB	98,0MHz	R115	Si le voyant TUNED et celui STEREO ne sont pas allumés, enlever R115.

(*4) Le voyant TUNED devrait être éteint dans les limites de 20 kHz à 40 kHz lorsque l'on s'éloigne d'une fréquence accordée (dans n'importe quelle direction).

Section du tuner AM

- Raccorder le cadre AM fourni entre les bornes AM ANTENNA et GND.
- Raccorder le générateur de signal AM (AM SG) à la borne AM ANTENNA à travers use résistance de 10 kΩ.
- Régler le TX-1060 sur la bande AM.

(*3) Accorder AM SG sur le TX-1060.

Etape	FM SG (déviation 1 kHz, ±75 kHz) Fréquence	FM SG (déviation 1 kHz, ±75 kHz) Niveau	Affichage de fréquence TX-1060	Point de réglage	Procédure de réglage
1	Aucun signal		531kHz	L301	1,3±0,1 V, CC entre la borne E(VT) (AWB-065) et la terre.
2	Aucun signal.		1602kHz	TC302	10±0,5 V, CC entre la borne E(VT) (AWB-065) et la terre.
3	Répéter les étapes 1 et 2 jusqu'à ce que les deux spécifications soient correctes.				
4	603kHz(*3)	76dB	603kHz	T301	Régler jusqu'à ce que la tension de CC entre la borne No. 1 (AMS) et la terre soit sur une valeur maximum.
5	1395kHz(*3)	76dB	1395kHz	TC301	
6	Répéter les étapes 4 et 5 jusqu'à ce que l' on obtienne la sensibilité maximum.				

6. AJUS

Sección del sin

- Conectar el
  antena fanta
- Poner el TX

(*1) Sintoniza
(*2) Conectar
  modulaci

Paso	(1kHz, ±75 Frecuencia	Nivel	TX-1060 Frecuencia display	Punto de ajuste	Procedimiento de ajuste
1	90,0MHz				
2	106,0MHz				
3	90,0MHz				
4	Repetir los Oltimo pas				
5	98,0MHz				
6	98,0MHz				
7	98,0MHz Sin				
8	98.0MHz (Modula (Principa				
9	98.0MHz (Stere				

(*4) El indicad
  desde una

Sección de sint

- Conectar la
- Conectar el
  de 10kΩ.
- Poner el TX

(*3) Sintoniza

Paso	(1kHz, ±7 Frecuencia	Nivel	TX-1060 Frecuencia display	Punto de ajuste	Procedimiento de ajuste
1	N				
2	N				
3	Repetir lo				
4	603kHz				
5	1395kHz				
6	Repetir lo				

6. RÉGLAGE

(le point de réglage avec spécifications est placé sur la pièce, sauf poru l'ensemble de l'extrémité avant (AWB-065).)

Section du tuner FM

- Raccorder le générateur de signal FM (FM SG) à la borne de 75Ω de FM ANTENNA à travers l'antenne fictive de 75Ω.
- Régler le TX-1060 sur la bande FM.

(*1) Accorder le FM SG au TX-1060.

(*2) Raccorder le générateur de signal stéréo multiplex FM à la borne du modulateur externe FM SG. Régler la modulation à la déviation 1 kHz/L R/±68,25, déviation pilote 19 kHz/±6,75 kHz.

Etape	FM SG (déviation 1 kHz, ±75 kHz)		Affichage de fréquence TX-1060	Point de réglage	Procédure de réglage
	Fréquence	Niveau			
1	90,0MHz (*1)	20dB	90,0MHz	(*5) L102, T101, L103 (AWB-065)	Régler jusqu'à ce que la tension CC entre la borne No. 2 (FMS) et la terre soit sur une valeur maximum.
2	106,0MHz (*1)	20dB	106,0MHz	TC101, T101, L103 (AWB-065)	
3	90,0MHz (*1)	20dB	90,0MHz	(*5) L102 (AWB-065)	
4	Répéter les étapes (2) et (3) jusqu'à ce que la tension CC entre les bornes No. 2 (FMS) et la terre soit sur une valeur maximum. L'étape 3 doit étre celle qui sera exécutée en dernier.				
5	98,0MHz (*1)	20dB	98,0MHz	T102 (AWB-065)	Régler jusqu'à ce que la tension entre la borne No. 2 (FMS) et la terre soit une valeur maximum.
6	98,0MHz (*1)	66dB	98,0MHz	L101	Régler la tension CC entre la borne No. 3 et celle No. 4 sur 0V (*4).
7	98,0MHz (*1) Sans modulation	66dB	98,0MHz	VR201	Régler le signal entre la borne No. 5 (VCO) et la terre sur 76 kHz (dane les limites de ±150 kHz)
8	98,0MHz (*1) Modulation stéréo (*2) (Principal = 1 kHz, L ou R)	86dB	98,0MHz	T102 (AWB-065) (Dans les limites de ±90°)	Régler jusqu'à ce que la distorsion à la borne L et R OUTPUT (sortie) soit également minimum.
9	98,0MHz (*1) Modulation stéréo	38dB	98,0MHz	R115	Si le voyant TUNED et celui STEREO ne sont pas allumés, enlever R115.

(*4) Le voyant TUNED devrait être éteint dans les limites de 20 kHz à 40 kHz lorsque l'on s'éloigne d'une fréquence accordée (dans n'importe quelle direction).

Section du tuner AM

- Raccorder le cadre AM fourni entre les bornes AM ANTENNA et GND.
- Raccorder le générateur de signal AM (AM SG) à la borne AM ANTENNA à travers use résistance de 10 kΩ.
- Régler le TX-1060 sur la bande AM.

(*3) Accorder AM SG sur le TX-1060.

Etape	FM SG (déviation 1 kHz, ±75 kHz)		Affichage de fréquence TX-1060	Point de réglage	Procédure de réglage
	Fréquence	Niveau			
1	Aucun signal		531kHz	L301	1,3±0,1 V, CC entre la borne E(VT) (AWB-065) et la terre.
2	Aucun signal.		1602kHz	TC302	10±0,5 V, CC entre la borne E(VT) (AWB-065) et la terre.
3	Répéter les étapes 1 et 2 jusqu'à ce que les deux spécifications soient correctes.				
4	603kHz(*3)	76dB	603kHz	T301	Régler jusqu'à ce que la tension de CC entre la borne No. 1 (AMS) et la terre soit sur une valeur maximum.
5	1395kHz(*3)	76dB	1395kHz	TC301	
6	Répéter les étapes 4 et 5 jusqu'à ce que l' on obtienne la sensibilité maximum.				

6. AJUSTE

(AJUSTES (E1 punto de ajuste con especificaciones está localizado sobre la parte, excluyendo el ensamble de extremo frontal (AWB-065).)

Sección del sintonizador FM

- Conectar el generador de senales FM (FM SG) al terminal de 75Ω de la ANTENA FM a través de la antena fantasma de 75Ω.
- Poner el TX-1060 en la banda FM.

(*1) Sintonizar el FM SG al TX-1060.

(*2) Conectar el generador de sehal stéreo multiplex FM al terminal modulador externo FM SG. Poner la modulación a la desviación 1kHz/L R/±68,25 principal, desviación 19kHz/±6,75kHz piloto.

Paso	FM SG (1kHz, ±75kHz de desviación)		Visualización de frecuencia TX-1060	Punto de ajuste	Procedimiento de ajuste
	Frecuencia	Nivel			
1	90,0MHz (*1)	20dB	90,0MHz	(*5) L102, T101, L103 (AWB-065)	Se ajusta hasta que el voltaje de C.C. entre el terminal No. 2 (FMS) y la tierra se hace máximo.
2	106,0MHz (*1)	20dB	106,0MHz	TC101, T101, L103 (AWB-065)	
3	90,0MHz (*1)	20dB	90,0MHz	(*5) L102 (AWB-065)	
4	Repetir los pasos (2) y (3) hasta que el voltaje de C.C. entre No. 2 (FMS) y GND sea máximo. E1 paso 3 siempre debería ser el Oltimo paso efectuado.				
5	98,0MHz (*1)	20dB	98,0MHz	T102 (AWB-065)	Se ajusta hasta que el voltaje de C.C. entre el terminal No. 2 (FMS) y la tierra sea máximo.
6	98,0MHz (*1)	66dB	98,0MHz	L101	Ajustar el voltaje de C.C. entre el terminal No. 3 y No. 4 a 0V (*4).
7	98,0MHz (*1) Sin modulación	66dB	98,0MHz	VR201	Ajustar la señal entre el terminal No 5 (VCO) y tierra a 76 kHz (dentro de ±150 kHz).
8	98.0MHz (*1) Modulación stereo (*2) (Principal = 1 kHz, L o R)	86dB	98,0MHz	T102 (AWB-065) dantro de ±90°	Se ajusta hasta que la distorsión en los terminales OUTPUT L Y R es iqualmente mínimo.
9	98.0MHz (*1) Stereomodulación	38dB	98,0MHz	R115	Si el indicador STEREO y el indicador TUNED no están encendidos, sacar R115.

(*4) E1 indicador TUNED debería apagarse entre 20y 40kHz, cuando se mueve lejos (en cualguier dirección) desde una frecuencia sintonizada

Sección de sintonizador AM

- Conectar la antena de bucle AM suministrada entre los terminals ANTENA AM y GND.
- Conectar el generador de señales AM (AM SG) al terminal de la ANTENA AM a través de un resistor de 10kΩ.
- Poner el TX-1060 en la banda AM

(*3) Sintonizar el AM SG al TX-1060.

Paso	FM SG (1kHz, ±75kHz de desviación)		Visualización de frecuencia TX-1060	Punto de ajuste	Procedimiento de ajuste
	Frecuencia	Nivel			
1	No hay señal		531kHz	L301	1,3±0,1 V C.C. entre el terminal E(VT) (AWB-065) y tierra.
2	No hay señal		1602kHz	TC302	10±0,5 V C.C. entre el terminal E(VT) (AWB-065) y tierra.
3	Repetir los pasos 1 y 2 hasta que ambas especificaciones sean correctas				
4	603kHz (*3)	76dB	603kHz	T301	Ajustar hasta que el voltaje de C.C. entre el terminal No. 1 (AMS) y tierra sea máximo.
5	1395kHz(*3)	76dB	1395kHz	TC301	
6	Repetir los pasos 4 y 5 hasta que se logre la sensitividad máxima.				

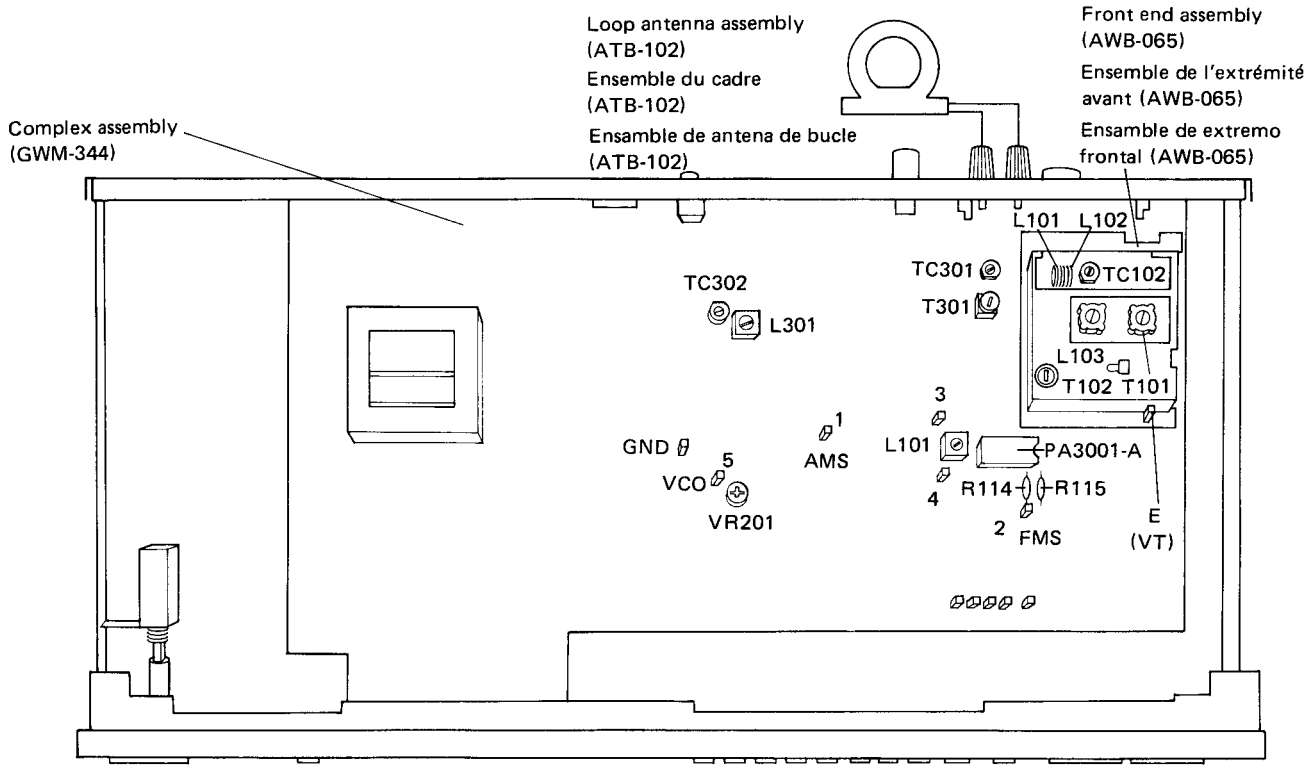
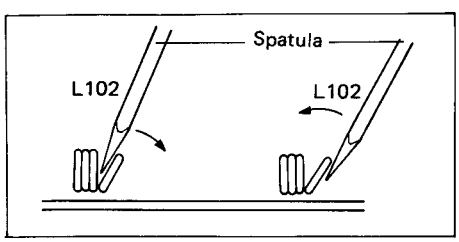


Fig. 6-1 Adjustment positions
Positions de réglage
Posiciones de ajuste

(*5) Adjustment Tuning Coil L102

(*5) Bobine D'accord de Réglage L102

(*5) Bobina de Sintonización de Ajuste L102.

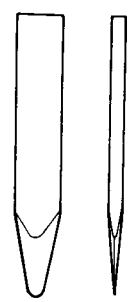


To make the output maximum by opening and closing of the first right side turn of the coil.

Pour une sortie maximum ouvrier est fermer le premier tour du côté droit de la bobine.

Utiliser la spatule dont le bord est mince. La spatule ne doit pas étre en métal (par exemple, en résine éposique de fibre de verre).

SPATULA
SPATULA
ESPÁTULA



Use a spatula whose an edge is thin. The apatula is not metal (ex. Glass-Cloth Epoxy Resin).

Hacer la salida máxima abriendo y cerrando el primer giro del lado derecho de la bobina.

User una espátula cuyo borde sea delgado. La espátula no debe ser de metal (por ej. Resina epóxica de fibra de vidrio)